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COMPUTERWORLD

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Lotus celebrates with IBM pact

Ten-year deal marks fifth birthday; LAN, mainframe products promised

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. last week celebrated its fifth anniversary by signing a 10-year joint marketing and development agreement with IBM. The agreement will put Lotus spreadsheets on IBM mainframes and lead to a series of future applications jointly developed and marketed by the two companies.

Lotus also announced that it will develop two new versions of its 1-2-3 software for personal computers and will release a data base management system optimized for use on local-area networks.

The agreement with IBM, which is similar to Microsoft Corp.'s five-year operating systems development agreement, gives IBM exclusive marketing rights to 1-2-3/M, a mainframe version of the popular Lotus spreadsheet that is scheduled to be available early next year.

Lotus also announced several products aimed at connecting to LANs and IBM host systems. The products include Lotus/DBMS, a line of LAN, SQL-based relational data base products whose engine is compatible with IBM's DB2.

The Lotus/DBMS line will be based on a data base engine licensed from Gupta Technologies, Inc. in Menlo Park, Calif., *Computerworld* has learned.

The DBMS products will run under IBM and Microsoft Corp.'s Operating System/2

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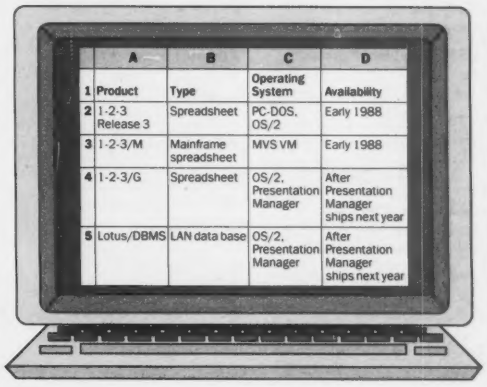
Lotus spreads out

Data base manager, advanced version of 1-2-3 are in firm's plans



	A	B	C	D
1	Product	Type	Operating System	Availability
2	1-2-3 Release 3	Spreadsheet	PC-DOS, OS/2	Early 1988
3	1-2-3/M	Mainframe spreadsheet	MVS VM	Early 1988
4	1-2-3/G	Spreadsheet	OS/2, Presentation Manager	After Presentation Manager ships next year
5	Lotus/DBMS	LAN data base	OS/2, Presentation Manager	After Presentation Manager ships next year

CW ILLUSTRATION: MITCHELL J. HAYES

DB2 to tap buffer potential

BY CHARLES BABCOCK
CW STAFF

IBM is preparing a change to DB2 that will expand its buffer pools and increase its ability to process high transaction volumes, industry sources recently said.

"I think the majority of users will not be affected immediately. But all of a sudden, IBM will run benchmarks that will set people to thinking about running more production systems under DB2," said Robert B. Ashton, principal of DB View, Inc., a Waltham, Mass., producer of a DB2 security management system.

DB2 is currently benchmarked as being able to process 45 to 50 transactions per second. Ashton said applications geared to make use of large DB2 buffer pools might be able to double that rate by dramatically reducing their need for mechanical I/O to disks.

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DEC hatching plan for flexible VAX upgrades

BY NINAMARY BUBA MAGINNIS
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. is expected to announce by July a flexible upgrade scheme for its VAX 8000 series computers, *Computerworld* has learned.

DEC reportedly has promised users an upgrade plan with recent product releases but has not publicly revealed details.

However, the firm appears to be making its upgrade path as open as possible, giving mid-range users several migration options (see chart page 8). VAX 8200 users, for example, will be allowed to upgrade to the new 8250 single processor or the 8350 dual processor, according to sources close to DEC.

Under the proposed plan, VAX 8300 users can also upgrade to the 8350. Currently, there is no upgrade option in place for 8200, 8250 and 8300 users.

VAX 8500 and 8530 users will be able to migrate to the recently announced 8550, and 8700 users will be able to upgrade to the 8800 dual processor, sources revealed. These upgrade options are in line with DEC's earlier statement of intention.

If users demand a delivery date, sales representatives have reportedly been told to quote an August time frame. DEC sales agents have been in-

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9370 delivers for GTE

Mass mail net goal of early installation

BY STANLEY GIBSON
CW STAFF

TAMPA, Fla. — An early user of IBM's 9370, GTE Data Services, Inc., is building a nationwide mass-mail distribution system with the much-anticipated mid-range processor as a key component.

GTE received the first of 25 9370s to be used in the network on schedule three weeks ago and said it expects to receive the remainder shortly.

With a summer-long beta-site test of the minicomputer and the mail network just beginning, Sheldon Danto, business manager for the project, praised IBM for its timely delivery and its support in installing the computer and bringing up the operating system. "We were pleased that IBM got it to us as early as they did," he said.

GTE personnel have reported that the 9370 runs the VSE operating system without problems and, thus far, is easy to use. They declined, however, to offer a more detailed analysis of the 9370's performance, pointing out that they have only had the computer in their possession a short time.

9370 gap fillers

IBM pledges to fill in 9370 communications lineup within 60 days. Page 6.

GTE Data Services is developing the system for Tcom Systems, Inc., based in Washington, D.C. Tcom will reportedly offer the service, scheduled to be available Sept. 1, to large businesses that need to

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NEWSPAPER

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IN THIS ISSUE

Speed's their creed. ETA Systems and Thinking Machines have separately announced the world's fastest computer. The ETA 10, capable of 8.32 GFLOPS, runs eight CPUs and attains its higher speed by supercooling and parallel processing. The CM-2, capable of 2.5 GFLOPS, operates on large amounts of data at once by assigning one processor to each data element. Pages 12, 14.

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Quotable

"In past jobs, I used to stay for three years. In this one, it's been 20. It's time to get on and do some different things."

JOHN J. CULLINANE
CHAIRMAN, CULLINET SOFTWARE, INC.

See story page 2.

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Pioneer Cullinane sets course on new career

BY CLINTON WILDER
CW STAFF

WESTWOOD, Mass. — John J. Cullinane, a pioneer of the mainframe software industry and one of its most outspoken executives, announced last week that he will resign as chairman of Cullinet Software, Inc. this September.

Cullinane, 52, said he will start a new corporation in an unspecified, noncomputer-related field, possibly in investments or discrete manufacturing. He said he will, however, continue as a Cullinet consultant two days per week. Cullinane said he will also continue to meet with the data base management systems vendor's top customers and prospects.

Cullinane controls some two million shares of Cullinet stock.

Chairmanship to Chapman

Cullinane said he will pass the chairmanship to Vice-Chairman and CEO David L. Chapman at the company's annual meeting on Sept. 22. Chapman had been brought in by Cullinane as second-in-command last year [CW, March 17, 1986]. Cullinane said he will also give up his seat on the board.

The timing of the move may have come as a surprise, but Cullinane has been attempting to phase out his day-to-day management role for several years.

"I've wanted to do some different things for a long time," Cullinane said in an interview last week. "When the company stubbed its toe several quarters ago, I wanted to become more involved and make sure it came out all right; and the new management team has worked out even better than I had hoped."

Cullinane admitted that his new venture is still "fuzzy" but emphasized that he is not retiring.

"I'm not going down to Cape Cod to go sailing," he said. "I expect to be very, very busy. Change is the essence of life. If you stay in the same position, after a while, you feel like you're just solving the same problems over and over again."

Profit-growth streak ends

Cullinet has recently faced a very uncharacteristic problem: red ink. After years as the software industry's premier growth model, Cullinet saw its streak of 29 consecutive profit-growth quarters end abruptly in 1985. The company then dropped into the loss column, in which it still resides. However, Cullinane expressed optimism in the company's long-term prospects under Chapman and President George W. Tamke.

"I'm passing the reins and giving a vote of confidence to a very strong management team," he said.

Cullinane founded the company, then known as Cullinane Corp., in 1968. It acquired its flagship data base product, IDMS, from The B. F. Goodrich Co. in 1973 and rode the product's sales to a successful public offering in 1978. In 1982, Cullinet became the first independent software house to be listed on the New York Stock Exchange.

John J. Cullinane

Analysts said Cullinane's departure is more significant as an industry milestone than as a major change for the company.

"It has been obvious for three years that he was trying to work his way out of an active role, and then they got in trouble," said W. Christopher Mortenson of the investment banking firm Alex Brown & Sons, Inc. "Recently, Chapman has been functioning as CEO, with John [Cullinane] being more of a marketing strategist and helping to close deals. He's leaving the company in good hands with a good strategic plan; now all they have to do is write the code."

"I don't think his departure is that significant," said Stephen McClellan of Merrill Lynch & Co. "Chapman has already taken aggressive action to change the stripes of the company with a whole new strategy. The jury is out on that, but at least they're not standing pat."

Will continue active role

Cullinane said he will continue his active role in political fundraising, charitable work and industry groups, including the Massachusetts Computer Software Council and the Center for National Policy in Washington, D.C.

Cullinane has been a visible supporter of Massachusetts Gov. Michael S. Dukakis, who last week officially announced his bid for the 1988 Democratic presidential nomination.

"I do owe Dukakis a fundraiser," Cullinane said.

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Compaq won't rush to PS/2

Compatible users do not need power of 32-bit bus, president says

BY ED SCANNELL
CW STAFF

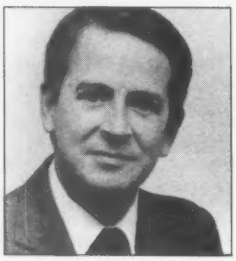
NEW YORK — Compaq Computer Corp. made it perfectly clear last week that it intends to continue support for the existing microcomputer standard and does not have any immediate plans to support the architecture used in IBM's recently announced Personal System/2 family.

In a briefing here, Compaq President Rod Canion said the company will be the standard bearer for "industry-standard personal computer solutions." The vast majority of the eight million users of IBM-compatible systems do not need the power of IBM's 32-bit bus to do their jobs, he said.

Not a priority

"We have seen no demand for a 32-bit bus on a desktop," Canion said. "We are advancing the performance of existing technology with coprocessors and higher clock speeds. But a [32-bit] extension of the existing bus is not a priority."

The technological advances made by IBM's new Micro Channel architecture create no major user benefits that could not have been accomplished within the existing standard, according to Canion.



Compaq's Canion

"IBM has spent a lot of time touting the importance of their new technologies and architecture. They haven't spent much time, however, describing the real user benefits of these advances," he said.

But something that will do a lot to sustain the existing standard, in Canion's opinion, is that Operating System/2, the multitasking operating system written for the Micro Channel, can be used with existing systems.

He claimed OS/2 will perform better on Compaq's 12-MHz Desktop 286 than the Intel Corp. 80286-based PS/2s.

"The truth is that optimized PC performance under OS/2 has little or nothing to do with the new bus," Canion said.

Useful in limited range

Canion conceded that the Micro Channel architecture is useful for a limited range of users. He said Compaq would develop a compatible product if there proved to be ample market demand.

However, he added that the company will release at least one more major product before the end of this year that will be compatible with the existing standard.

Besides compatibility with OS/2, the existing standard will flourish for the rest of the decade, according to Canion, because of the $80 billion that corporations have already invested and because the standard permits useful innovations to reach the market quickly and is cost-effective for a large number of users.

Another reason the standard will survive, Canion said, is that many major manufacturers realize how lucrative it is to continue providing products to a customer base of eight million.

Record revenue

No one realizes that better than Compaq, which last week reported record revenue and earnings for its first quarter. Revenue for the quarter increased 47% to $211 million, with earnings up 142% to $20.2 million.

Canion compared IBM's move away from the existing standard with The Coca-Cola Co.'s mistake of abandoning the "Classic" formula in favor of the "New Coke."

"Compaq is committed to sticking with the 'Classic' formula . . . true compatibility with the tried-and-proven industry standard," Canion said.

Apple's software move questioned

BY PATRICIA KEEFE
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc.'s surprise launch last week of an independent software company is being interpreted as an effort to stimulate development of Apple software — a move that could backfire if not handled right, observers said.

The new venture is also viewed in some quarters as a defensive move aimed at Microsoft Corp., which holds the dominant position in Apple software and which recently signed a five-year development pact with IBM. Observers said Apple is threatened by the relationship with IBM and would like to lessen its dependency on Microsoft software.

"If they don't handle this carefully, it could blow up in their faces," said Michael Orsak, an analyst with Robertson, Colman, Stephens in San Francisco.

Apple's announcement was vague, containing neither a company name nor financial information. The new firm will start off as a wholly owned subsidiary, becoming an independent company probably within one year. Apple is expected to retain a minority ownership interest. The new company will reportedly develop, publish and market applications — including some from third parties — for the Macintosh and Apple II computer lines.

Many small developers working on potential breakthrough software for Apple machines do not have the resources to bring those products to market. The new venture is intended to provide that opportunity under President and Chief Executive Officer William Campbell, formerly Apple's executive vice-president of U.S. sales and marketing.

Existing Apple-brand software such as Macwrite and Appleworks will be marketed by the new company under its own label. Apple will reportedly deemphasize its logo and label on applications as a gesture to developers concerned about competing with Apple. The Apple name and logo will not appear in the new venture's name or on its products.

Could become major force

The new venture could develop into a major force in the software industry, possibly becoming the fourth or fifth largest independent software company, analysts said. Apple has talked for years about forming a software company. It already has a significant software presence, generating about $50 million annually in software revenue.

Yet that revenue creates a sticky situation for Apple. Although the company wants to market its own products, it needs to encourage development of innovative software, regardless of source.

The issue came to a head over the flap caused by Silver Surfer, a French data base that Apple wanted to market. Those plans brought about a storm of protest from major Apple third-party developers — particularly Ashton-Tate, which is developing a data base for the Macintosh — forcing Apple to back off. Silver Surfer will be marketed by a U.S. subsidiary headed up by former Apple excutive Guy Kawasaki.

"I'm not sure a separate subsidiary is a wise move. It could confuse third-party developers, and its raises the specter of competition [from Apple], which has haunted them in the past," said Richard A. Shaffer, editor of "Computer Letter."

A less obvious reason for launching the startup is Microsoft's enviable positioning: A firm grip on Macintosh software balanced by a solid relationship with IBM. Apple does not like it one bit, sources said.

"It's clear Microsoft has taken the knowledge base gained in the Apple market and is applying it to the benefit of IBM," said Rob Campbell, president of Forethought and a former Apple software executive. "If you were Apple, are these the people you would want controlling your future? I sure wouldn't."

Jeffrey Raikes, Microsoft's director of applications software marketing, scoffed at those reports. "If that's their strategy, it's a mistake," he said. Apple's startup "isn't going to affect Microsoft's business at all."

HP unveils OSI-support products

GENEVA — Reinforcing its support for the international networking standard Open Systems Interconnect (OSI), Hewlett-Packard Co. presented here on Wednesday a new electronic mail package that it says is based on the OSI X.400 electronic mail protocols as well as on the new OSI/Session-Transport software for its HP 3000 MPE V systems.

The X.400 message handling protocol is part of the OSI framework that was defined by the Consultative Committee on International Telephone and Telegraph here.

HP executives meeting the press at their European headquarters for a two-day seminar stressed that the new products reflect the firm's commitment to internationally recognized standards.

"In the future, the network will transform itself into the system, with the individual computers connected to it the way the peripherals are today," predicted Wim Roelandts, general manager for the firm's Information Networks Group.

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IBM talks of plans to fill 9370, VM gaps

BY ROSEMARY HAMILTON
CW STAFF

IBM last week asserted that it would fill the crucial missing pieces of the 9370 communications architecture, probably within 60 days.

At a three-day meeting of consultants and software developers in Phoenix, IBM representatives told attendees that it plans to introduce the long-awaited LU6.2 and VTAM connectivity products for the 9370, allowing the system to participate fully as a departmental processor in Systems Network Architecture (SNA)-based corporatewide networks.

These plans are considered crucial by many industry watchers who claim that without advanced communications capabilities, the 9370 is little more than another stand-alone system.

"The 9370 is going to be IBM's primary distributed system, and that being true, they've got to improve the communications support, among other things. This box is the future of IBM," said Forrester Research, Inc. analyst George Colony, who attended last week's briefing.

The communications weaknesses center around the VM operating system, which IBM has slated as the key operating system for the 9370. Currently, VM only supports VTAM and SNA in a "kludgy fashion," as more than one consultant put it.

"While there have been some interim solutions, VTAM as part of VM is limited," said John Carosella, a consultant at Network Strategies, Inc. in Fairfax, Va. "IBM has never brought VM machines into SNA comfortably — and the 9370 brings this problem to a head." IBM needs to fix this problem quickly to cement pending 9370 orders, Carosella noted, adding that a 9370 without full communications "is just another System/36."

The 9370 currently provides LU6.2 Advanced Program-to-Program Communications verbs that permit "LU6.2-like conversations" through its TSAF networking software, Carosella noted.

At last week's conference, attendees said that IBM discussed plans to more fully integrate a 9370 into an SNA network, which it could achieve with full VTAM support. Officials also reportedly outlined plans to provide enhanced peer-to-peer communications with support of LU6.2

Such steps are critical to sustain the 9370 momentum IBM has built up since its introduction late last year, said attendee John Myrna, president of VM Systems Group, Inc., a maker of VM utility programs.

"DEC claims to have it all, and IBM does too," Myrna said. "But without those communications offerings, IBM's claims are pretty hollow."

In addition to the enhanced communications capabilities, IBM also indicated that a number of hardware and software announcements are scheduled for the near future.

Topping that list were new 9370 models, attendees said, although they added that IBM offered no details on the forthcoming processors.

Other 9370-related introductions that were discussed include:

- A production-scale version of CICS for VM.
- Enhanced CCITT X.25 support for the 9370 and possibly for other IBM systems.
- Multidrop 9370 connections for connecting multiple 9370s on one SNA line.
- Remote dial-up connections between 9370-based networks and other SNA networks.

The 9370 enhancements, particularly in the VM area, should flow over into other IBM systems, said Frank Dzubeck, president of Washington, D.C., consulting firm Communications Network Architects, Inc. The "9370 is a point product that will open up IBM's bus architecture."

Although it was not discussed openly at the conference, many knowledgeable observers anticipate a new release of VM/Extended Architecture that would move it from 24- to 31-bit addressing and increase its virtual memory capabilities to 2G bytes.

Senior Editors Elisabeth Horwitt and Charles Babcock and senior writer Donna Raimondi contributed to this report.

9370 delivers

FROM PAGE 1

send sizable batches of mail in a short period of time.

GTE Data Services selected the 9370 because it offers 56K bit/sec. communications on a low-end machine, according to Raymond Adams, technical director of the Tcom project.

The 56K bit/sec. speed is frequently used in VSAT satellite communications, which are planned for the network.

GTE Data Systems' *Sheldon Danto (right) views 9370 with John Reich, company engineer.*

In addition, the 9370 can output to a laser printer, another key requirement, Adams said.

Meeting requirements

All major minicomputers on the market, including those from Digital Equipment Corp. and Tandem Computers, Inc., were considered by GTE for use in the network. The IBM 9370, however, was the only one to meet all key requirements, according to Adams.

Tandem machines, for example, could handle his bandwidth requirements but were not satisfactorily adaptable to a laser printer, Adams said.

And while DEC minicomputers could handle most of the requirements, they did not offer 56K bit/sec. communications in system sizes that GTE was considering, he added.

Adams said simplicity and ready availability were key requirements in selecting a processor, because the nodes will not have trained personnel on-site but instead will be managed remotely from Tampa, Fla.

"There's nothing exotic about it," Adams said, referring to the off-the-shelf 9370 Model 20 that will be used in each node. Each processor will be equipped with 8M bytes of memory and 400M bytes of disk storage, he said.

The 9370 Model 20 is not upgradable; instead of upgrading a node as its traffic increases, identical nodes will be added, with no engineering limit to the total number of nodes in the network, Adams said.

The hub IBM 3090 mainframe in Tampa will run IBM's CICS under MVS. The 9370s in the field will also run CICS, but under VSE.

GTE said it plans to use IBM's Netview Systems Network Architecture-based network management system to provide a window on the network.

Netview PC will be used at each node, Adams said, simply by adding a board to the IBM Personal Computer AT that will serve as a terminal for the 9370 and running Netview PC software on the AT.

The star-shaped network will consist of 25 identical nodes. Using modems, the 9370s at the nodes will connect via land lines or satellite links to GTE's 3090 hub in Tampa.

Each node will be housed in a simple, small office space without elevated flooring. In addition to a 9370, each node will include a laser printer and an inserting machine for putting letters into envelopes.

Businesses will send their computer-generated mail to the Tampa hub either directly or by way of one of the regional nodes. At the Tampa data center, address lists will be analyzed and sorted by ZIP code.

GTE Data Services will then transmit the mail to one or several of the 25 Tcom regional nodes, where the documents will be printed on laser printers, placed in envelopes by automatic inserting machines and sent to the U.S. Postal Service for first-class delivery.

Tcom will pay GTE $50 million over five years for its services in running the network, according to a recently signed contract. Retired Postmaster General William F. Bolger is Tcom's chairman.

Tcom said it will guarantee two-day delivery throughout the U.S. and that next-day delivery will be performed in most cases.

Ideal users

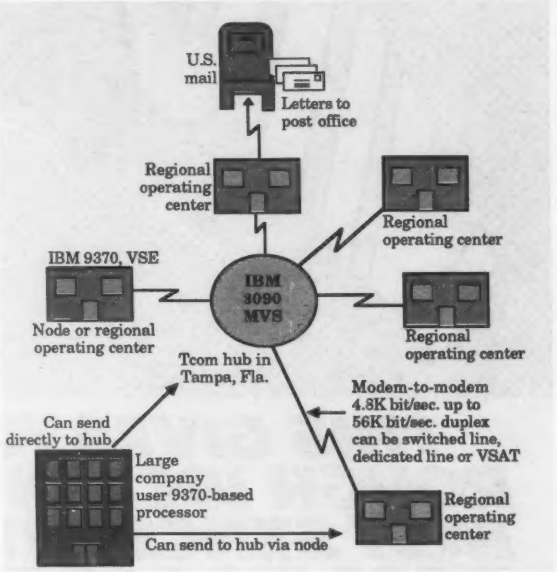
Automobile manufacturers sending out recall notices to customers, political candidates and fund-raisers appealing to voters and contributors and hotel chains sending out confirmation letters to guests will all be ideal users of the network, according to Danto.

At first, users must generate their letters on IBM 370 architecture or plug-compatible machines. Later, other processors could be supported, Danto indicated.

GTE has written proprietary software to make the system work, including its own document creation software, which it will provide for users.

Network 9370

Tcom Systems plans to install IBM 9370 units at 25 regional operating centers


U.S. mail
Letters to post office
Regional operating center
Regional operating center
IBM 9370, VSE
IBM 3090 MVS
Node or regional operating center
Regional operating center
Tcom hub in Tampa, Fla.
Modem-to-modem 4.8K bit/sec. up to 56K bit/sec. duplex can be switched line, dedicated line or VSAT
Can send directly to hub
Large company user 9370-based processor
Regional operating center
Can send to hub via node

INFORMATION PROVIDED BY GTE DATA SERVICES
CW CHART: MITCHELL J. HAYES

Ungermann-Bass builds on Linkware host ties

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — A micro-to-mainframe package unveiled last week by Ungermann-Bass, Inc. provides file access between any combination of IBM Personal Computers and compatibles; Apple Computer, Inc. Macintoshes; and IBM, Digital Equipment Corp. or Hewlett-Packard Co. mainframes and minicomputers.

Universal File Manager (UFM) is an enhanced version of the Linkware micro-to-mainframe software marketed by Ungermann-Bass' Linkware Corp. subsidiary. UFM runs on top of Ungermann-Bass' Net/One and Universal Workstation series.

Net/One UFM transfers files between incompatible computers and transforms them into different formats. It also restricts data access to authorized users. UFM provides users with a consistent interface into a multivendor environment. In short, Net/One transports the user to the host, and Linkware provides access to host information.

"How you connect to the host is no longer an issue," said Georganne Benesch, UFM product manager for Ungermann-Bass. "Using our [Net/One] physical transport layers and media, it doesn't matter if the customer is using baseband, broadband or token-ring. The Universal File Manager is the next step to actually doing what the customer wanted to do all along — easily and simply transfer information throughout a corporation in a method that can be easily administered," Benesch said.

UFM is not a file extraction program. Instead, it takes the host native file and transforms it to a PC file, or vice versa. Users can then go in and pull out selected information from controlled volumes or libraries and then download that information to a PC-based application.

A menu-driven user interface allows PC users to retain a PC view of the world, regardless of what host they are linked to.

UFM has a core product, called the Universal File Transfer, and two options, the Universal File Transformer and the Universal File Administrator.

Universal File Transfer incorporates a menu-driven user interface common to all types of workstations and resides on both hosts and PCs, providing file transfer service for most types of files to and from mainframes, minicomputers and PCs.

The host-resident Universal File Transformer reformats and translates data into host and PC formats. Also host-resident, the Universal File Administrator option provides security, such as enabling users to see only the names of those files to which they have access.

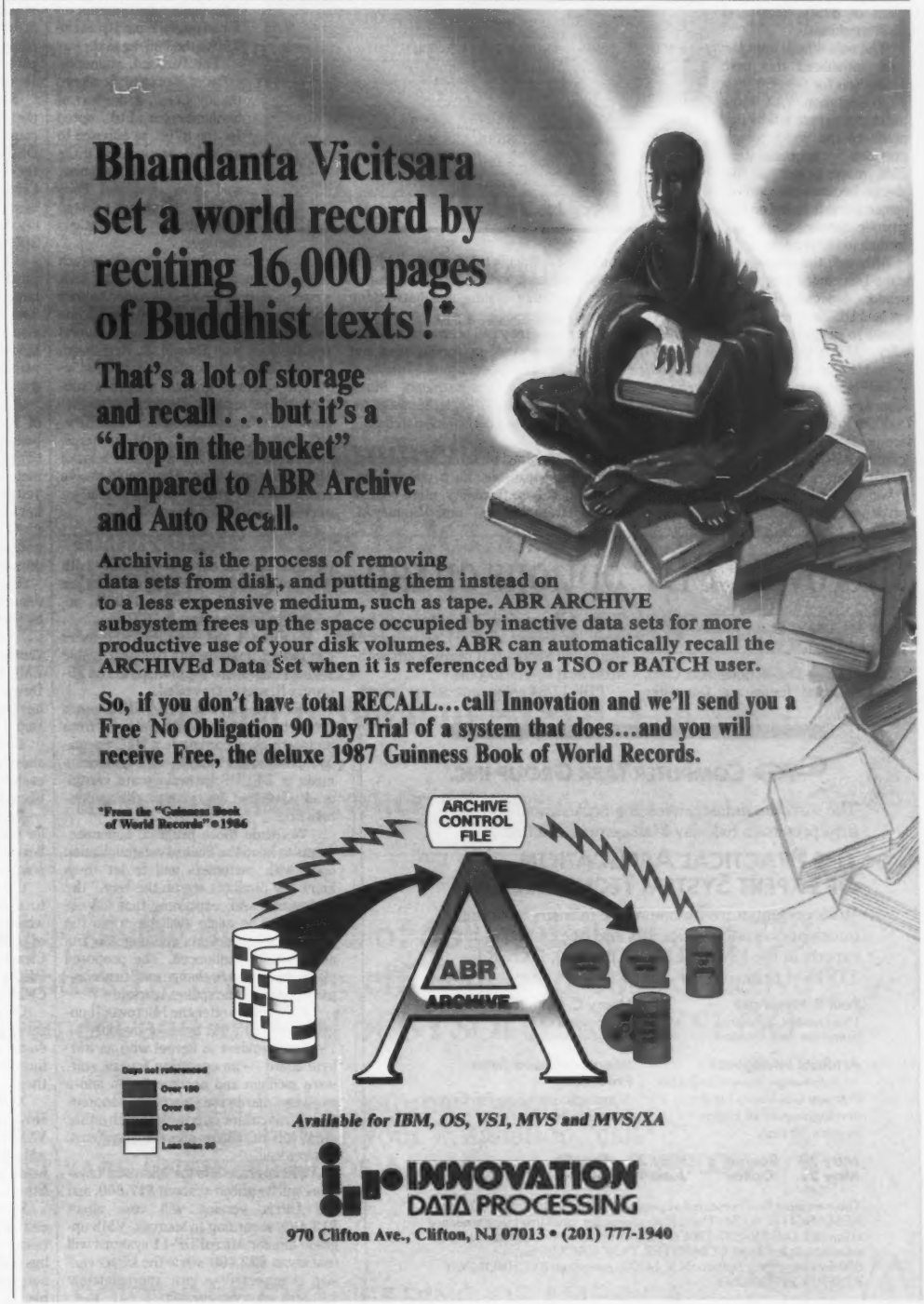
Pricing for Universal File Transfer begins at less than $1,500 for minis, $7,000 for mainframes and $225 for PCs. The Universal File Transformer starts at less than $600 for minicomputers and $3,000 for mainframes. The Universal File Administrator begins at less than $1,000 for minicomputers and $4,500 for mainframes.

CORRECTIONS

Three hundred screens of a New York Employees Retirement System application were incorrectly attributed to a workbench used in developing the application [CW, March 2]. Developers Barry Brown and Lewis Stone say the prototype of their data dictionary was done after the Retirement System project.

In "Paring down the phone bill with fiber optics" [CW, March 30], the manufacturer of the fiber-optic modems and multiplexers is Canoga-Perkins in San Jose, Calif.

First-quarter earnings shown in the chart in the Computer Industry section [CW, April 27] were in millions of dollars, not thousands, as the chart indicated.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DEC upgrades

CONTINUED FROM PAGE 1

structed to release upgrade information prior to the company announcement only in critical situations, sources said.

The vendor declined comment on the impending announcement.

DEC has been ironing out some upgrade details ever since its March 4 announcement of 8250, 8350 and 8530 machines.

The only official upgrade path announced this past winter was for the 8500-to-8530 migration. VAX 8500 users can expect a field upgrade to the 8530, which provides approximately 25% more power, at no charge because the performance boost is based on microcode enhancements, according to the vendor.

DEC's upgrade plan

Processor	MIPS*	to	Processor	MIPS		Upgrade Price
8200	1.0	→	8250	1.4	=	$12,000
8200	1.0	→	8350	2.0	=	$40,000
8250	1.4	→	8350	2.0	=	$35,000
8300	1.9	→	8350	2.0	=	$20,000
8500	3.0	→	8550	5.8	=	$150,000
8500	3.0	→	8530	4.0	=	No charge
8530	4.0	→	8550	5.8	=	$150,000
8700	5.8	→	8800	10	=	$300,000

* Millions of instructions per second

CW CHART

Although the upgrade plan seems to make DEC more competitive with other vendors, especially IBM, industry observers said DEC's scheme is not in direct response to IBM's 9370, the so-called VAX killer. "Digital is very aware of the 9370 — and should be very aware of the 9370 — but these, in fact, are evolutionary announcements that are just falling out of Digital's R&D efforts," said Sandy Gant, vice-president of mid-range systems research for Infocorp, a Cupertino, Calif.-based market research firm.

William J. Milton Jr., a DEC observer and deputy manager for Brown Brothers Harriman & Co., a New York-based bank, said, "I think DEC is clearly on its own path. IBM is DEC's biggest competitor by virtue of IBM's size. I don't think DEC has done any of this in response to anything IBM has done.

"DEC has its own formula for success and is just following that formula," Milton added, referring to DEC's single architecture, operating system and networking marketing approach.

Users said they had been aware DEC's upgrade plan would be forthcoming and noted that the proposed policy will help maintain hardware investments. Many users reported that DEC's promised migration path helped determine purchasing decisions.

"I'm certainly in favor of every upgrade path available. Each possible upgrade adds more flexibility, more control over our capital assets," noted Stanley M. Rose, vice-president of distributed processing and technical support for New York-based Bankers Trust Co.

Rexnord Automation, a division of the Milwaukee, Wis.-based Rexnord, Inc., is evaluating VAX 8250 and 8350 processors. "The upgrade is important for us because in the older line, we have gotten stuck between the 750s and 785s," noted Don Awalt, director of corporate information services at Rexnord's Cockeysville, Md., facility. DEC did not offer an upgrade path from the 750 to the 785, he said.

The Portland, Maine, facility of Fairchild Semiconductor Corp., a division of Schlumberger, Ltd., opted for the 8700, as opposed to an 8550, because of DEC's earlier upgrade promise, said Alvin Bugbee, Fairchild's computer-assisted engineering operations manager.

Chicago-based Quaker Oats Co., which has just contracted to purchase 12 VAX systems during the next year for factory automation, installed an 8200 in the home office for software development several months ago, said Ronald T. Brzezinski, vice-president of information systems.

The upgrade promise played a substantial role in Quaker's decision to purchase DEC equipment rather than Hewlett-Packard Co. and IBM systems, Brzezinski said. "That was what a lot of plant personnel liked. They could evolve configurations without having to take giant leaps each time," he noted.

Closed BI bus still hot issue in Dexpo hall

BY STANLEY GIBSON
CW STAFF

NASHVILLE — Rumblings about an increasingly less than cordial attitude by Digital Equipment Corp. toward third-party vendors could be heard during Dexpo South held here last week.

Some 5,000 DEC users converged on the Nashville Convention Center in the country music capital to view the wares of DEC-compatible vendors. Meanwhile, at the Opryland hotel, Digital Equipment Computer Users Society (DECUS) members attended meetings and viewed a variety of new VAX 2000 workstations and 300 series terminals.

Of DEC's emerging attitude toward third-party equipment companies, one large user said, "It's like going to a dance with someone and leaving with someone else." What got DEC to its current prestigious position — openness toward add-on vendors — appears to have been abandoned, he said.

The closed VAXBI bus was the target of Xyplex, Inc. President Paul Rosenbaum's ire. "They're making it needlessly difficult. What they're trying to do is dominate the market for attachments. When you close the bus, you shut down the market for attachments," Rosenbaum said.

At the time of the VAXBI bus announcement, DEC licensed some 30 vendors to develop for the bus.

But other vendors, although not licensed by DEC, have not been deterred by the closed bus.

Getting around the problem

EMC Corp. in Natick, Mass., displayed at Dexpo its memory boards for the VAXBI bus that include a reverse-engineered BI chip.

Clearpoint, Inc. in Hopkinton, Mass., showed its memory controller boards, each of which includes a BI chip that has been transplanted from DEC's boards.

Users purchasing Clearpoint controller boards must trade in a DEC memory board with a BI chip on it, which Clearpoint later reuses.

Clearpoint's memory boards can grow to a total memory size of 64M bytes, while DEC memory can increase to a total of 48M bytes on the VAX 8200 and 8300. Clearpoint's prices are some 30% below DEC's, according to Robert Tatar of Clearpoint.

Other major memory board suppliers, such as Emulex Corp. and Dataram Corp., do not offer BI bus boards but would not foreclose the possibility of ever offering them.

Xyplex, meanwhile, introduced its Host Interface Software, which runs on a VAX 8000 series processor (with BI bus), and allows it to connect to its several network processing products through an Ethernet controller.

Xyplex also announced a new front-end processor called the BI Communications FEP for the VAXBI bus. It allows BI bus computers to connect to either Ethernet, linear coaxial cable or broadband cable.

Microvax, PDP options on tap

BY NINAMARY BUBA MAGINNIS
CW STAFF

NASHVILLE — Digital Equipment Corp. informed Digital Equipment Computer Users Society (DECUS) attendees last week to expect PDP-11/84 enhancements and Microvax II upgrade kits within the next several months.

PDP-11/84 enhancements are expected to include one expansion package with nine option slots and 650W and another package with 27 slots and 1100W, according to sources close to DEC.

Microvax I and MicroPDP-11 users can expect upgrade kits that will enable them to migrate to the more powerful Microvax II, sources revealed.

DECUS, the worldwide DEC users group, bars both the public and press from its meetings, according to a DEC company spokesman. Vendor announcements made at DECUS gatherings are considered privileged information, the spokesman said.

"We made those program announcements to keep the lines of communication open with customers and to let them know the products are on the way," the spokesman said, explaining that full details would be made available when the product enhancements and upgrade kits are officially announced. The proposed plans are subject to change until final company approval, the spokesman said.

DEC plans to offer the Microvax II upgrade kits with 9M bytes of memory — 1M byte resident in kernel with an 8M-byte board — an operating license, software medium and documentation and a one-year hardware warranty, sources said. Plans call for offering kits with either the VMS or Ultrix operating systems, sources said.

VMS upgrade kits for Microvax I systems will be priced at about $17,800, and the Ultrix version will cost about $13,400, according to sources. VMS upgrade kits for MicroPDP-11 systems will cost about $22,400, while the Ultrix version is expected to cost approximately $20,300, sources revealed.

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ASM to till fertile end-user computing field

BY DAVID A. LUDLUM
CW STAFF

LOUISVILLE, Ky. — The Association for Systems Management (ASM) plans to heed some of its own advice and broaden its focus to address the explosion of end-user computing, the group's incoming President Steve Adamson said at its annual conference last week.

ASM, which is celebrating its 40th anniversary this year, plans to expand its scope to attract members from a new category of systems professional — the "end-user counselor," Adamson said.

The move will address sweeping changes in the industry wrought by the growth of end-user computing and reflect advice that group members often hear in educational programs, Adamson noted.

ASM plans to embark upon a campaign that will include strengthening current programs and enhancing recruitment and promotion, said Adamson, an office head for divisional support at California Federal Savings and Loan Association in Los Angeles. Leading the implementation of the program will be Executive Director David B. Sturtevant, previously vice-president and director of public communications for ADAPSO.

The new thrusts — for which ASM directors have authorized $300,000 — follow the recommendations of a consultant's study that was commissioned after an internal report found ASM lacking a marketing focus, Adamson said.

The consultant reported that ASM had become "static in a dynamic world," with a stable membership among a growing market led by the rise of end-user counselors.

Some comments from those attending the conference reflected concern about end-user computing.

Nancy Ryan, a systems consultant for the consulting and recruitment firm Groupe Sobeco, Inc. in Montreal, said one of her leading concerns is controlling changes users make in projects under development. "It's demoralizing to be constantly, constantly changing factors," she said, adding that some users have acquired just enough knowledge to make them dangerous.

In a session on expert systems, Robert Keller of the Harvard, Mass.-based consulting firm Renaissance International Corp. outlined a program for disseminating expert systems in an organization by giving potential end users development shells costing $500 or less.

The use of such technology to address issues of the changing times was stressed in the keynote address on "The Trans-Industrial Revolution" by David P. Snyder, an editor of *The Futurist* magazine. Competition from countries with low-cost labor and a shrinking pool of entry-level workers will call for "mobilizing intellectual capital," using methods such as expert systems, Snyder said.

In contrast with the emphasis on disseminating technology, conference attendee Ernie Borgel said he has been striving to control technology already in use. Borgel is an information systems manager for Virginia-based Project Hope, a charitable group that promotes health care in underdeveloped countries.

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Hancock inks Intelogic pact

BY CLINTON WILDER
CW STAFF

BOSTON — Providing a much-needed boost for the fortunes of Intelogic Trace, Inc., John Hancock Financial Services last week announced a one-year microcomputer maintenance agreement with the San Antonio-based independent service firm.

Although the amount of the contract is less than $1 million, it represents Intelogic Trace's first deal with John Hancock Financial Services, a leading insurance and financial services company. The firm is a division of John Hancock Mutual Life Insurance Co.

The agreement also marks a step in Intelogic Trace's efforts to widen its maintenance base away from the product line of beleaguered Datapoint Corp., which still accounts for about 95% of Intelogic's revenue. Datapoint Chairman Asher B. Edelman spun off Intelogic Trace as a separate business after his hostile takeover of Datapoint in 1985.

Intelogic Trace will service a network of Unisys Corp. microcomputers as well as printers, modems and peripherals from various vendors for John Hancock's corporate offices and independent agencies nationwide. Intelogic Trace spokesman William Roper said the contract will expand as John Hancock adds nodes to the network, if the user is satisfied with Intelogic Trace's service.

John Hancock has been using both Unisys and in-house maintenance on the micros, a John Hancock official said.

Intelogic Trace is attempting to rebound from recent quarterly losses and top management changes. President and Chief Executive Officer John L. Hale resigned last November and was replaced by board member Clark R. Mandigo.

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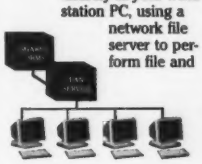

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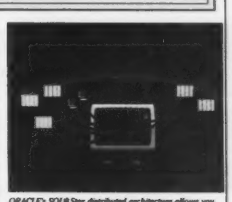

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Super-fast ETA 10 computer debuts

BY STANLEY GIBSON
CW STAFF

TALLAHASSEE, Fla. — ETA Systems, Inc. formally announced here last week the ETA 10, a supercomputer claimed to be the world's fastest computer that will be capable of 8.32 billion floating-point operations per second (GFLOPS).

The serial number 1 ETA 10, part of the Florida State University Supercomputer Computational Research Center, was introduced at a media show here. The computer was housed in a box sporting Florida State maroon striping. The machine on display had two of what will later be four CPUs. The ETA 10 can run a maximum of eight CPUs.

Earlier versions of the ETA system were capable of reaching only 1.28 GFLOPS. The ETA 10 attains its higher speed by using both supercooling and parallel processing [CW, April 20].

In a separate development, Thinking Machines, Inc. also staked claim to the "world's fastest computer" title last week with the announcement of its more specialized Connection Machine Model CM-2 (see story page 14).

Headquartered in St. Paul, Minn., the 3½-year-old ETA Systems is a subsidiary of Control Data Corp. in Minneapolis.

Using a Fortran compiler, the ETA 10 can run programs written for the Cyber 205 or other computers in the CDC family, according to Dale Brantly, software engineer for the ETA 10. A full eight-CPU system, running at 7 nsec, will be 30 times faster than the Cyber 205. Prices for ETA 10 supercomputers will range from $5.5 million to $22 million. Work is currently being done on Pascal and C compilers.

The Florida State machine, however, is still not in its final form. It has software bugs that must be worked out before the university formally accepts it. And the machine has only two of its eventual four CPUs. Furthermore, the system now runs at 12.5 nsec. During the summer, it will be speeded up to 10.5 nsec, and in 1988, it will be accelerated to 7 nsec. Shared memory is now 64 million words, which will be doubled in the summer to 128 million words of memory.

Each CPU is about the size of a standard newspaper section and contains 240 chips that together contain nearly three million gates. The microprocessor that is the key building block of the system is a Honeywell, Inc. 20,000-gate array. Each CPU contains four million 64-bit words of memory.

The ETA 10 operating system is now VSOS, based on VSOS for the Cyber 205. ETA Systems is enhancing the operating system for interactive and batch use, said Lloyd Thorndyke, president of ETA Systems. The company will also be implementing AT&T Unix System V next year and is working on an NOS/VE interface.

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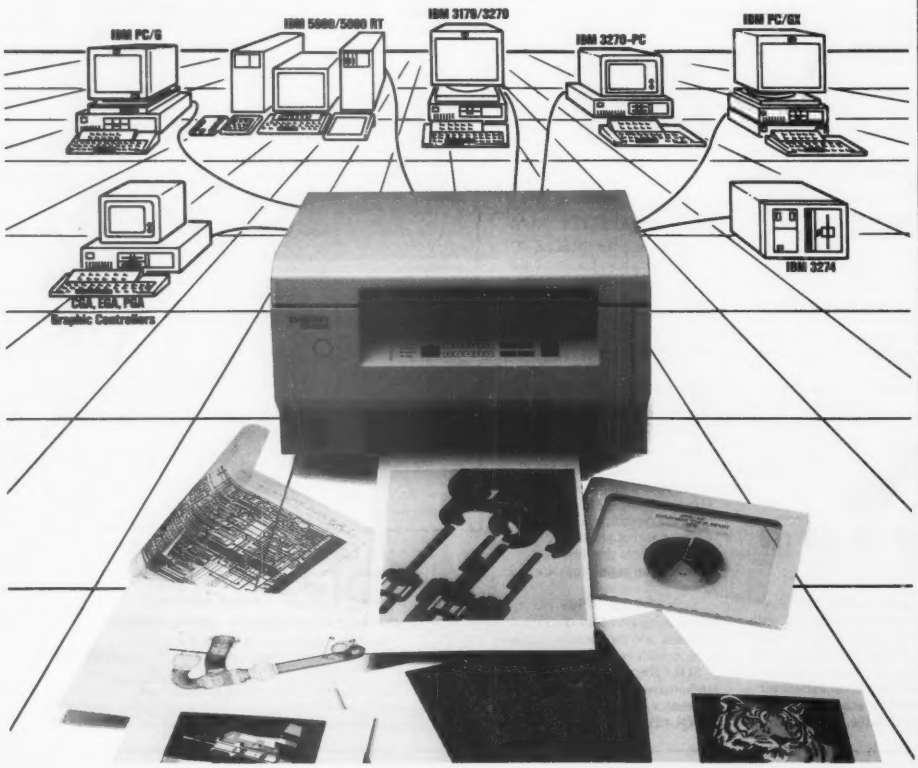

HP folds on Postscript ban

BY JEFFRY BEELER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week offered a tacit endorsement of Adobe Systems, Inc.'s Postscript page description language, marking a major boost for Postscript's drive to become an industry standard.

In a statement of intent, HP said it would support Postscript in addition to Imagen Corp.'s Document Description Language (DDL) and its own Printer Command Language (PCL). The move distances HP from a still-undelivered DDL, which HP has previously promoted as the only complementary language to PCL on the firm's Laserjet printer.

HP's push to promote DDL had increasingly put the company at odds with the rest of the industry, which regards Postscript as an emerging industry standard. Other computer vendors that have endorsed Postscript include IBM and Digital Equipment Corp.

From now on, users who specify an alternative to HP's PCL for their Laserjets will have to buy it from third parties rather than from HP, according to the firm.

Imagen last week announced its intention to supply the PC Publisher Kit, a card that provides DDL on the Laserjet. The company reportedly has finished development and plans to introduce the card in early June at Comdex/Spring '87.

In the long run, the vendor's change of mind will also broaden the selection of page description languages that users can specify with their Laserjet printers.

"What we're saying, in effect, with this announcement is that we're opening our architecture to support any language that gains sufficient acceptance in the marketplace," said Roger Archibald, product marketing manager at HP's Boise, Idaho, division. For users, HP's endorsement of Postscript will likely mean "a wonderful reduction in uncertainty," said Allen Paller, president of the AUI Data Graphics division of Computer Associates International, Inc.

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3317-8718

Feds soften Bell long-distance proposal

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Department of Justice last week backed away from its controversial proposal to change the 1982 AT&T divestiture decree in order to allow the regional Bell holding companies to offer limited long-distance services.

On Feb. 2, the Justice Department urged U.S. District Court Judge Harold H. Greene to modify the decree and permit the Bell companies to provide long-distance service outside the regional territories where they have monopoly control of the local exchanges.

But last week, in a second round of filings, the department said its long-distance proposal was too complicated to administer and enforce. Instead, the department recommended that Greene decide on a case-by-case basis whether to grant Bell companies petitions to offer long-distance services.

The department's retreat was a setback for the regional Bell companies, analysts said, noting that so far Greene has refused to grant any waivers for offering long-distance services.

Coincidentally, St. Louis-based Southwestern Bell Corp. last week filed a petition asking Greene to allow the company to provide private network interexchange services without geographic restrictions.

But George Dellinger, telecommunications analyst for Washington Analysis Corp., said he doubts Greene would ever let the divested Bell companies offer long-distance service, since the separation of local exchanges from long-haul service was the heart of the 1982 divestiture accord.

The International Communications Association, a major business users group, has expressed concern that allowing the financially strong Bell holding companies into the long-distance market would be disastrous for AT&T's struggling competitors in that market, MCI Communications Corp. and U.S. Sprint Communications Co. [CW, March 16].

Decision by Labor Day?

The Justice Department reaffirmed its Feb. 2 recommendations to lift the decree's restrictions on information services such as voice mail and electronic mail, equipment manufacturing and non-telecommunications business ventures. Greene is expected to make his decision by Labor Day.

The change in the long-distance recommendation was needed "because of the difficult line-drawing and enforcement problems that an appropriate modification would entail," said Charles F. Rule, acting assistant attorney general for antitrust.

For example, Rule said, it would be too difficult to define, unambiguously, the concept of long-distance services totally outside a Bell company's territory.

Officials at most Bell holding companies claimed that the original proposal did not go far enough in freeing them from the long-distance restriction because it would have prevented them from building private interexchange networks for large businesses within their service territories.

The Justice Department said the Bell companies could offer long-haul service inside their regions if state authorities remove regulatory barriers to competition in the local exchange market. But the department was unable to establish a nationwide standard for local competition, because the regulatory barriers vary from state to state, so that determination should be made on a case-by-case basis, too, Rule said.

Rule said the department will focus on removing the long-distance prohibition in its next triennial review of the AT&T divestiture.

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DEC gate swings both ways

BY ELISABETH HORWITT
CW STAFF

LITTLETON, Mass. — Digital Equipment Corp. last week added bidirectional initiation of file transfer to its gateway products that use IBM's Systems Network Architecture, allowing users to access files on a VAX without leaving IBM mainframe software environments.

The Decnet/SNA Data Transfer Facility (DTF) runs on DEC's Decnet/SNA Gateway and VMS/SNA server products as well as on VAXs and IBM 370s running MVS that want to exchange files. Without DTF, DEC's SNA connectivity products only permitted the VAX to initiate file transfer, explained Joanne Morin-Correia, the firm's personal computer interconnect marketing manager. IBM mainframe users could access VAX files only by contacting the DEC system and requesting it to send the file as an IBM Remote Job Entry (RJE) batch transfer.

"Before, all of the software was on Decnet; now, you have DTF running on the IBM mainframe, so it also can participate in the network, and users can stay in their familiar IBM environment — whether it is TSO or API — and won't have to learn RJE in order to access VAX files," Morin-Correia explained.

DEC also introduced Decnet/SNA VMS Advanced Program-to-Program Communications (APPC)/LU6.2 Version 2, which, working in conjunction with DTF, allows applications on either a 370 or a VAX to initiate a session between the two systems, DEC said.

At one large bank, for example, loan officers working on IBM Personal Computers can initiate a credit check through a DEC Microvax II that is connected to an IBM mainframe, in which the customer information resides. When the mainframe has completed the check, it contacts the Microvax II and downloads the results. All of the systems involved use LU6.2 peer-to-peer communications.

However, without the enhanced version of DEC's APPC software, the Microvax II would have had to stay on-line until the mainframe came back with the results, Morin-Correia said.

DEC has no immediate plans to enhance its current LU6.2 products with IBM's PU 2.1, she added.

PU2.1's continuing absence from DEC's product line has drawn fire from analysts and users since, as a result, VAXs can only use LU6.2 to communicate with an IBM host or other systems through an IBM host.

Scheduled to be available this month, DTF provides access to sequential QSAM and BSAM files. Pricing ranges from $2,100 for the Microvax 2000 to $21,000 for the VAX 8800. DTF client software for systems that perform the file exchange is priced between $900 for the Microvax 2000 and $9,000 for the VAX 8800. Client software for a 370/MVS mainframe host is priced at $20,000. Decnet/SNA VMS APPC/LU6.2 is available now and priced from $900 for the Microvax 2000 to $9,000 for the VAX 8800.

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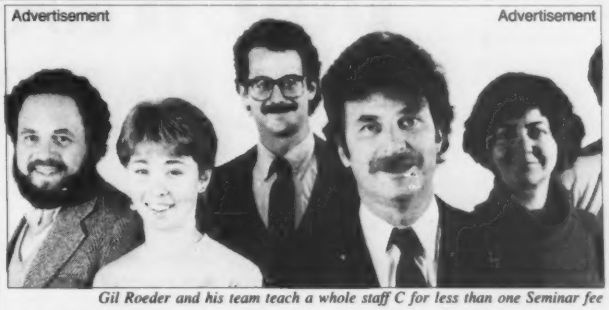

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Thinking Machines super joins high-speed elite

BY DAVID BRIGHT
CW STAFF

CAMBRIDGE, Mass. — Claiming to have developed the world's fastest computer, Thinking Machines Corp. last week announced a 65,000-processor system said to perform as many as 2.5 billion instructions per second.

The Connection Machine Model CM-2 is reportedly able to quickly run scientific applications with very large amounts of data by operating on all the data at once, instead of processing chunks of data as do conventional computers. The machine does this by assigning one processor to each data element.

The system is priced from $1 million to $5 million and includes either a Digital Equipment Corp. VAX system or a Symbolics, Inc. LISP machine as a front-end processor.

"A lot of companies set out to build the world's fastest machine. We set out to build a computer that fit the natural structure of large data problems," Thinking Machines President Sheryl Handler said. "We did in fact build the world's fastest computer."

Compared with the company's first product, the year-old Connection Machine Model CM-1, the CM-2 operates 2½ times as fast, has 16 times more memory and will have a floating-point option. The two machines come with either 16,000 or 65,000 processors. Thinking Machines also announced a Fortran compiler and a high-speed, 10G-byte mass-storage unit said to include self-diagnostic and self-healing capabilities.

The CM-1 and CM-2 machines are 5-ft black cubes decorated with thousands of flashing red lights. Each light represents 16 processors, but company officials conceded that the lights are for show as well as diagnostics.

Specialized applications

Thinking Machines is promoting the CM-2 for such applications as helicopter wake simulation, object recognition, seismic data processing, materials science, simulating the interaction between clusters of stars, document retrieval and very large-scale integration (VLSI) design simulation.

So far, at least 17 systems have been installed or ordered for delivery this year, Handler said. Customers with installed systems include Perkin-Elmer Corp., Yale University, the U.S. Naval Research Laboratory and the Defense Advanced Research Projects Agency.

Thinking Machines said it has been using a Connection Machine internally to design VLSI circuits. In that process, one processor is assigned to each transistor.

According to the company, the largest unit it has developed so far is a 22,000-transistor floating-point multiplier circuit, but it said designing a 1 million-transistor circuit is possible with the machine.

Another potential application is in "Star Wars"-type defense, the company said. Government contractor Perkin-Elmer, which has two CM-1 systems installed, is investigating the possibility of using the machines for such military applications as rocket line-of-sight computation and automatic target detection.

One analyst who tracks the scientific computing market said that the Connection Machine's adaptability gives it advantages over Cray Research, Inc.'s supercomputers in specific types of applications. While the areas in which Cray systems can excel are predetermined by the machine's design, the Connection Machine is, in a sense, "an ideal tool kit" for handling applications with many unpredictable variables, said Brian Boyle, director of research at Novon Research Group in Berkeley, Calif. "The more unpredictable things are, the more the Thinking Machine will be appropriate," Boyle said in reference to the Connection Machine.

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The Change Control Experts.

Stamping out mailing glitches

Postal Service licks costly returns with change-of-residence tracking

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Postal Service is using its computer data base of 30 million residential and business address changes to offer a service that helps business mailers save money by correcting their mailing lists.

The National Change of Address (NCOA) service not only saves mass mailers the cost of sending undeliverable mail but also saves the Postal Service the cost of sorting and forwarding mail with faulty addresses.

> "THE PERSON sending in that change-of-address card is setting in motion a lot of things that the postal patron probably wasn't aware of."
>
> CARL OPPEDAHL
> ATTORNEY

"What's so exciting about this is that it permits mailers to clean up lists before they mail rather than afterwards," says Van Seagraves, publisher of the "Business Mailers Review" newsletter in Washington, D.C. Industry sources say that an average mass mailing contains approximately 6% undeliverable or delayed mail as a result of inaccurate or outdated addresses.

So far this year, 2.3 billion addresses from 766 mailing organizations have been matched against the NCOA data base in order to update and "cleanse" the commercial mailing lists, according to John Sadler, project manager for the address-correction service.

A Postal Service contractor, First Data Resources, Inc. in Omaha, maintains the NCOA data base, using information from the change-of-address cards filled out by postal patrons, Sadler explains. Every two weeks, the company sends the latest data on magnetic tape to 18 licensed NCOA contractors — typically, data processing service bureaus for the direct marketing industry.

The NCOA contracters then offer a package of services that put the addresses in the approved format, add nine-digit ZIP codes and match the mailing list to the NCOA data base to make address corrections.

Broad appeal

The 7-month-old service is attracting mailers from publishing, direct mail, financial services and even local government agencies, according to Randy Wald, vice-president of sales for computer services at LCS Industries, Inc. in Clifton, N.J., one of the 18 licensed NCOA contractors.

One offshoot of the service, Wald says, is that his firm can create mailing lists of people who have just changed residences and of businesses that have moved offices. The so-called "new movers lists" are then sold to firms such as home insurance and office equipment companies.

While the NCOA service is considered a growing success, some privacy advocates are upset that the Postal Service has created a data base allowing businesses or government agencies to secretly monitor people as they change residences.

New York attorney Carl Oppedahl says the NCOA service could be used, for example, to match a list of suspected communists to monitor their residential moves. Oppedahl adds he also is concerned that commercial mailers using NCOA need not ever mail anything to obtain the new address, so people are not aware they are being monitored.

"The person sending in that change-of-address card is setting in motion a lot of things that the postal patron probably wasn't aware of," Oppedahl says.

Potential for abuse

Robert Ellis Smith, publisher of the "Privacy Journal" newsletter in Washington, D.C., agrees that the NCOA data base is a tempting target for government and commercial abuse.

"It's a data base that, if it occurred in the Soviet Union, many people would be very cynical about — namely, a computer list of everybody's movements and whereabouts in terms of change of residence," Smith says.

In response, NCOA officials say there are adequate safeguards to protect personal privacy. They note that the information is supplied on a voluntary basis by postal patrons who fill out the change-of-address card and that the NCOA service conforms to the federal Privacy Act.

The Change of Address Order postcard carries the following notice: "Privacy Act: Filing this form is voluntary, but your mail cannot be forwarded without an order. If filed, your new address may be given to others."

Seagraves of the "Business Mailers Review" calls the privacy concerns "hogwash." He says the NCOA service simply uses computer technology to supply mailers with corrected addresses before mailing rather than using the manual method of supplying corrected addresses after mailing.

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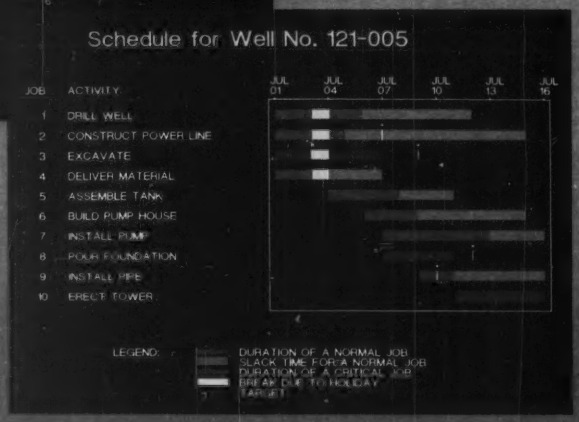

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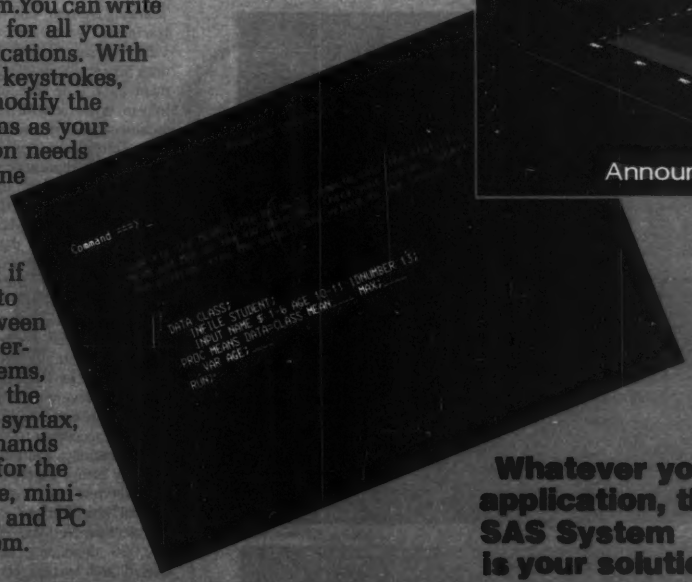

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Cincom steps up drive for CIM market

BY JAMES A. MARTIN
CW STAFF

SAN DIEGO — Cincom Systems, Inc. strengthened its push last week to become a leading player in the computer-integrated manufacturing (CIM) market with the announcement of a new version of its Control:Manufacturing system and of agreements to jointly develop and market products with five other CIM vendors.

In addition, Cincom said a new release of Net/Master, its VTAM network management system, will be available this fall. Version 2.0 will provide on-line session tracking, a network and system management data directory and expanded capabilities under the IBM MVS/XA operating system, the firm said.

At its annual user conference, held here last week, Cincom executives said CIM and network management are two areas of increasing importance to both manufacturing and traditional MIS shops. "Users are looking for integrated CIM solutions, but no one provides anything close to that — it's just too big," said Thomas McLean, vice-president of marketing and product planning.

Cincom announced that Control:Manufacturing 6.0, a manufacturing resource planning system for IBM mainframes and Digital Equipment Corp. VAX minicomputers, will be available in June.

Modules in pipeline

New modules for the system will reportedly include Order Management System, said to automate the customer credit and collection process, and Project Manufacturing Control, designed specifically for project-oriented manufacturers such as defense contractors.

In addition, Control:Manufacturing 6.0 is set to include a vendor analysis subsystem for the Purchasing module that is said to provide automatic analysis of a vendor's quality, price, delivery and overall performance. Security is reportedly enhanced in the system.

Control:Manufacturing will be priced from $25,000 to $65,000 per module depending on hardware configuration and will be available for both IBM mainframes and DEC VAX environments, according to Cincom.

Cincom officials said the growth of distributed processing environments and data networks has created an increasing need for network management. "The network area has become the biggest bottleneck in a company's efforts to run a smooth computer operation," said Thom Vollman, marketing manager for networking and communications. "The bottom line is to get the data where it needs to be."

New Net/Master 2.0 optional modules will reportedly include The Network Tracking System, said to provide session tracing and accounting, and Info/Master, a data repository system said to provide a directory of network and system management data. The directory consists of a fully inverted file with search, sort and selection capabilities, according to the company. Info/Master will serve as the basis for several applications, including network configuration management and problem management, the vendor said.

Plans call for Net/Master to eventually support distributed data base environments. "We have several projects going on right now to test the different alternatives for distributed processing and distributed data base capabilities," Vollman said, adding that these capabilities are only in the planning stages. He did not give any additional information.

The new version of Net/Master was designed to better compete with IBM's Netview, according to Vollman. The Network Tracking System component reportedly brings functions to Net/Master that Netview had already with Network Logical Data Manager.

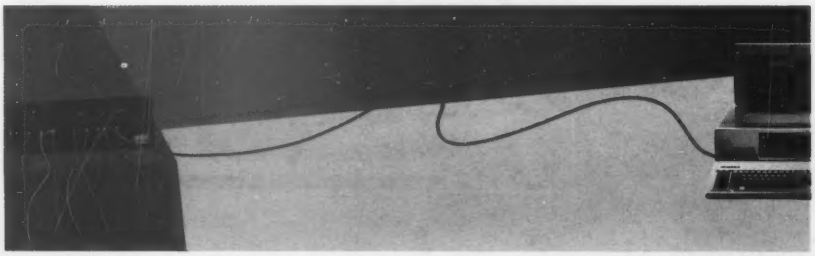
Prices for Net/Master 2.0 will begin at $10,000 depending on modules purchased and system configurations, the company said.

CIM alliance

Cincom also announced at the conference that it had formed an allegiance with five CIM-based vendors: Litton Industrial Automation Systems, Inc., Intergraph Corp., Epic Data, Inc., John A. Keane & Associates and Systonetics, Inc.

The CIM Alliance Program is aimed at developing partnerships with CIM vendors to jointly pursue marketing and product development for the CIM marketplace, the company said. The goal of the program is to develop interfaces between existing products to "bridge technology gaps and provide customers with the computer-integrated solutions they require," Cincom President and Chief Operating Officer Dennis Yablonsky said. No new products are expected to be jointly developed in the near future, officials added.

"These partnerships are definitely more than marketing relationships," Yablonsky said. "Each relationship will include specific projects or areas of product development." The alliance with Litton, for example, has focused on developing an Integrated Manufacturing Planning Service designed to help users in planning and installing CIM systems in factories.



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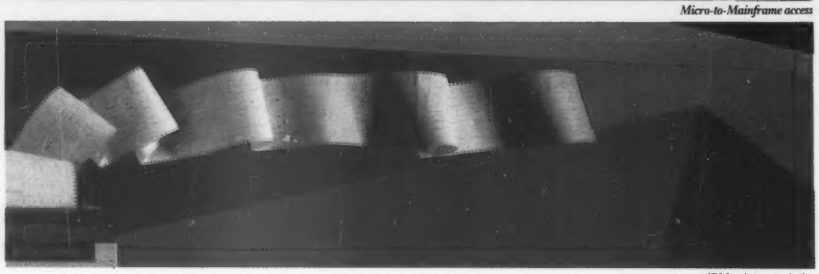

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EDITORIAL

Invest for payoff

Rep. Richard Gephardt (D-Mo.) has a nice feather in his presidential campaign cap with last week's close vote in the House of Representatives favoring his trade protection amendment. Unfortunately, it brings the U.S. no closer to solving the fundamental technological and political problems underlying its woeful trade imbalance.

Rather than focusing on Band-Aid approaches designed to prop up manufacturers, candidates now staking claims for the presidency would better serve their country by debating what needs to be done to turn around the continuing slump in productivity in the U.S. manufacturing segment.

Gephardt's amendment to an omnibus trade bill, approved by a whisker-thin 218-214 vote, would ultimately force the president to invoke trade retaliation against countries that run up a trade surplus with the U.S. and are deemed to protect their own markets. Given the unlikelihood of final approval, the amendment would seem crafted more to appeal to base instincts than to resolve the underlying issues.

Trade imbalance is indeed a major problem for the U.S. these days, but starting an international protectionist battle is not the way to deal with it. The Computer and Business Equipment Manufacturers Association referred to the amendment as a missile launched at Japan and West Germany "that will in fact turn in midair, target the sender and strike the core of American industry."

The trade imbalance tide will not turn until U.S. manufacturers again lead the nation in innovation and creativity. It is becoming increasingly clear that the manufacturers must make the expensive investment in information systems technology that their counterparts in the service industries long ago decided was the key strategic tactic to maintain a competitive edge.

Manufacturers can boost productivity by improving their ability to rapidly produce new products in the face of changing demand. Many have already started trimming the lengthy process of design through the use of automated design systems, and some have even begun to automate the documentation process that can delay market entrance long after a product is ready.

The ultimate step is to tie together the existing pockets of automation into the realistic goal of fully computer-integrated manufacturing. That requires investment in technology and in personnel skilled in integrating information systems. The payoff will be the ability to rapidly retool production lines when demand for existing products slips, rather than waiting and watching while an entire manufacturing process begins the long and painful process of obsolescence.

Foreign protectionist tendencies were not a major issue when American factories were the most productive in the world. The U.S. is still a world leader in information technologies and it is time political leaders turned their attention to using that resource to modernize a decaying manufacturing base.

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LETTERS TO THE EDITOR

Shattering dreams

Michael Bradley, in his letter about Section 1706 [CW, March 23], has not grasped why there is so much opposition to this section of the new tax reform.

The common law rules, which Bradley refers to as the "20 questions," are not suitable for making a fair determination as to the employee/self-employed status of someone in the computer programming, engineering or drafting professions. From my understanding, these rules were originally created for making judgments in cases of manual labor; they are harsh when applied to the type of work a technical professional does. It was because of this lack of clarity and the subsequent confusion of who is and who is not self-employed that the safe harbor provisions were created.

Additionally, Bradley speaks about a "no risk" situation. Since the 20 common rules are used for a qualitative evaluation as opposed to an absolute evaluation, in many cases there is no way to know if an audit of an individual will go one way or the other, and it is because of this that many brokers/contractors are reluctant to use self-employed subcontractors. Most of the brokers with whom I have spoken are not taking any risks. They don't want to be the ones to test the law — it's expensive even if you win.

Therefore, Section 1706 has indirectly prevented many individuals who are entitled to be self-employed using the 20 questions as a justification basis from working as such. I firmly believe that anyone who uses the status of self-employed merely to avoid paying his fair share of taxes should be nailed. However, the present hammer is shattering a lot of hardworking, honest people's dreams too.

Benjamin Kaufman
Independent Consultant
Computer Design and Software
Harriman, N.Y.

This week in history

May 2, 1977
Seventy-five percent of Americans support legislation that would "lay down rules for the way business and other private organizations deal with information" about individuals, a Harris survey reports. The poll also says that the percentage who feel they surrender their privacy as soon as they seek credit grew to 67% from last year's 50%, while respondents who feel "threatened" by files of personal data went from 23% in 1976 to 32% this year.

May 3, 1982
A criminal court judge in Brooklyn rules that it is not illegal for an employee with authorized access to use his employer's computer for personal reasons. Judge Michael R. Juviler dismisses theft of services charges against New York City Board of Education systems programmer Thomas Weg, who allegedly stored data on racehorse breeding on the school system's computer, stating that it would have been a different story had Weg "plugged into a computer that was being leased to the public and was simply trying to avoid payment."

Two ain't bad

It was sad to read "Users boo Olsen's MAP attack" [CW, April 20] because the Manufacturing Automation Protocol (MAP) enthusiasts quoted are badly misinformed about Ethernet (IEEE 802.3) and Digitial Equipment Corp.'s Decnet, which uses it; sad because *Computerworld* thinks it is helpful when it accentuates such gibberish as "Ethernet is like hitchhiking, and broadband is like taking a bus"; and sad because your users' lost objectivity brings them to disparage Ken Olsen's integrity because he disagrees with them.

MAP was three things. First, it was an application protocol for manufacturing automation. Second, MAP was transport protocols using the emerging Open Systems Interconnect (OSI) standards. And third, MAP was token bus local-area network (LAN) hardware. I would like to join Olsen and MAP supporters who have concluded that two out of three ain't bad. The token bus has not worked out as well as planned, and Ethernet has been shown to be an effective LAN system. The merger of token-based MAP and Ethernet-based Technical Office Protocol (TOP) and their cooperation with the Corporation for Open Systems (COS) is good news indeed. Now we can have compatible OSI transport with freedom to choose whichever LAN suits us.

If you really think Ethernet is like hitchhiking, you deserve the token bus. When you learn the error of your ways, thanks to MAP/TOP/COS, you can switch more easily to Ethernet.

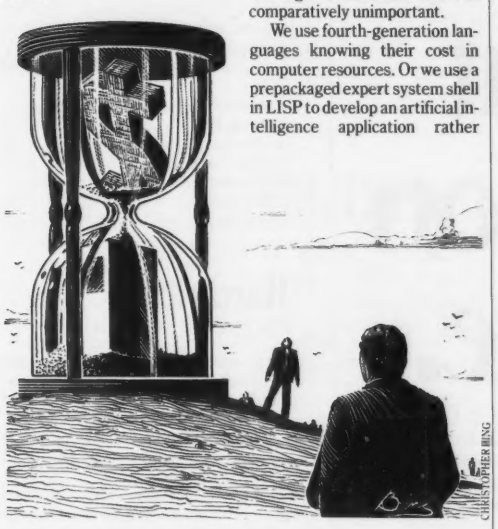
Bob Metcalfe
Ethernet inventor
3Com Corp. chairman
Santa Clara, Calif.

Recognizing what hardware is doing

EFREM G. MALLACH

Steve Wallach, cofounder of Convex Computer Corp., offers this thought: "The computing capacity of the United States would be doubled overnight if people knew how to program."

Taken in context, Wallach was 100% on target. Inefficient programming wastes enormous amounts of machine time. He drew examples from Fortran and scientific/engineering applications, the major Convex markets, but equally good ones can be found in the commercial world.



CHRISTOPHER BING

Wallach's statement is provocative, and it raises two questions: First, is there a benefit to this programming inefficiency that outweighs the enormous cost to correct it? Second, is coding efficiency really the issue?

Surprisingly, there can be a benefit to inefficient programming. Nobody writes inefficient programs on purpose. People write inefficient programs because they don't know better, or because they don't take the time to do a better job.

Not knowing better has many causes. If, as Wallach points out, the programmer is ignorant of how Fortran arrays are stored in memory and is therefore ignorant of the best subscript order for the most efficient array processing, he can be told the information that will cure the problem, and the program.

Most situations are more subtle, however. Much inefficient programming occurs because $80,000 superprogrammers are not normally hired. If we tried to hire the few superprogrammers that do exist, we would drive their going rates up to $150,000 or more and make the situation even worse.

In practice, our choice is often to deal with inefficient code by throwing more hardware at it or tripling programmer salaries to save money on equipment.

Another factor is time. Often, we need results fast. Getting a program up and running a month sooner is worth a great deal. Getting it to run 20% faster is comparatively unimportant.

We use fourth-generation languages knowing their cost in computer resources. Or we use a prepackaged expert system shell in LISP to develop an artificial intelligence application rather than writing our own in assembly language. Writing our own would add two years to the project schedule. Competitors would eat our lunch while we learned LISP.

These decisions are conscious management choices to trade off hardware cost against programmer time. They are, in principle, no different from a management request to get a critical, strategic decision support program running quickly and tune it later, or a management decision to hire $30,000 programmers knowing that the $80,000 variety could write more efficient programs.

The above argument is not an apology for sloppiness. Most MIS executives are understandably intolerant of sloppy work.

It is also not an excuse for running an untuned, inefficient shop. I am simply stating that doubling computer capacity, however desirable that goal sounds, comes with a cost. If we

Continued on page 22

Mallach is associate professor of computer science at the Boston College School of Management and a consultant to vendor and user organizations.

What will buyers do with PS/2?

1) Embrace it; 2) reject it; 3) wait and see; 4) pick Macintoshes

AMY WOHL

Every analyst in the computer business is crowded into a tiny New York City hotel ballroom and regaled for hours with speeches about how the world has changed. *The New York Times* and *The Wall Street Journal* are awash in full-page ads. We've swapped Charlie Chaplin for the "M*A*S*H" gang in the TV ads.

IBM's new personal computer — excuse me — Personal System/2 announcements are the talk of the town. But what are we talking about?

Surely, elegant hardware. In fact, there is a kind of Japanese elegance to the new IBM products. They are based on making things smaller, more streamlined and better integrated — all qualities for which we normally look toward Japan. And they're faster, contain more IBM-made parts and will be more reliable — indications of product maturity and not simply of new products.

With no software in sight that exploits the power of an Intel Corp. 80386 chip, it is a little hard to demonstrate just what all this wonderful new technology is for. It is harder still to see why millions of personal computer users should give up the safe haven of 20,000 software packages, multiple vendors of identical or similar products as well as an entire industry that is quickly creating extensions to basic personal computer products.

Here's the trade-off: IBM is tired of sharing its customers with competitors, particularly ones who often trade on the incredible popularity of the IBM PC concept without paying much for enhanced product design, support and integration. IBM's best customers are those large firms that also buy their mainframe computers. Voila — a product that promises to be better integrated with IBM's mainframe world and is, at least for the moment, not available from IBM's competitors.

IF IBM is successful in fencing off the product with patents and trade secrets, an exact IBM-compatible PS/2 may be altogether impossible.

In fact, if IBM is successful in fencing off the product with patents, trade secrets and legal wizardry, an exact IBM-compatible PS/2 may be altogether impossible. It's an IBM dream: more customer control, a larger market share in the only part of the PC market IBM really cares about and an entire industry swooning over IBM's ability to once again set new standards.

The $64,000 Question is: "What will the customers do?"

There are three possibilities:

1. Customers might strongly buy into the PS/2 concept, which could cause lessened sales of other products while they wait for the PS/2 market (and its software) to develop. It could also, but probably won't, produce big PS/2 sales right away. Much of the uncertainty here rests on the nonavailability of operating system and applications software. Why buy hardware if the software isn't ready yet?

2. Customers might wait to see how the PS/2 does in the market and if, when and what software appears. In this case, IBM could have a long wait for PS/2 business to develop. If potential PS/2 buyers continue to purchase 80286 and 80386 technology long enough, a large inertial mass could be created, making an eventual switch to PS/2 products less likely.

3. Customers might reject the PS/2 concept out of hand. This rejection is most likely from the sophisticated end users who enjoy shopping for bargain prices and hot-off-the-press features in a competitive market. Since IBM's underlying theme in the April 2 announcement was one of dampening competitive pressures, such customers might feel staying in the competitive environment — at least until the PS/2 market develops further — might be a good idea. I've already heard from a number of

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Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Kanban in Poughkeepsie: A lesson learned from Japan

STANLEY GIBSON

It might come as a surprise to the amiable, God-fearing citizens of the lower Hudson River Valley, those spiritual descendants of Ichabod Crane and Rip Van Winkle, that in their happy land of fertile, rolling farms, an Oriental activity called Kanban is now widely practiced.

The activity is not sinister, however, and, far from threatening the moral underpinnings of the valley, it may help guarantee its prosperity. Kanban is carried out at installations of the valley's single largest employer, IBM.

During a recent tour of IBM's facilities, I spotted the word Kanban displayed ubiquitously throughout the shops. Kanban is an acronym for several Japanese words that describe an inventory control plan. The method is practiced throughout IBM's manufacturing facilities in the valley, including Poughkeepsie, N.Y., where the top-of-the-line 3090s are made.

Minimum and maximum

Kanban consists of two numbers, one low and another high — say, nine and 34. The nine represents the minimum number of a certain component needed in stock in order not to jeopardize the smooth manufacturing operation; 34 signifies the maximum number of that component required. Keeping within the Kanban limits assures continuous manufacturing with just-in-time delivery of parts and avoids stockpiling an unneeded and costly inventory.

IBM adopted Kanban techniques at the suggestion of IBM Japan management, which came to Poughkeepsie with ideas about improving efficiency.

Ironically, IBM is viewed by some pro-America diehards as the best hope to combat the Japanese in high technology. That IBM is not too proud to use a Japanese idea in the process is a good sign and offers a lesson from which other U. S. manufacturers should learn.

The Japanese had a long road to travel to arrive where they are today. They suffered through a period in the 1950s and early 1960s during which "Made in Japan" meant "cheaply made." They learned from their own mistakes as well as from ours. Their Deming Medal, named after an American, symbolizes excellence in manufacturing quality.

Why shouldn't the U.S. learn from Japan? Detroit waited until it was almost too late. IBM is learning now, while it is still in first place. All the more reason for it to remain there.

Gibson is a *Computerworld* senior writer.

Buyers and PS/2

CONTINUED FROM PAGE 21

corporate customers who feel that waiting and possibly opting out of PS/2 might be the right thing to do, especially with the likely fire-sale prices on current generation PC-ATs.

Let's look at some likely scenarios:

• IBM's biggest customers will start moving to the PS/2 technology to the extent that IBM-friendlies (MIS directors in IBM mainframe shops, for example) control the decision.

• Many IBM customers, including some big ones, will choose to take advantage of temptingly priced current 80286 technology and hold off on PS/2 commitments until some PS/2 software arrives, which will not be this year.

• A few IBM PC users will strongly reject IBM's determining the future direction of PC product design to the exclusion of the enhancement makers. These users will opt for moving away from the PS/2 strategy into other arms, which might include, but are not limited to, Compaq Computer Corp., standard 80286 and 386 technology, Unix platforms and Apple Computer, Inc..

• The clone market will be in total turmoil. I've already received frantic phone calls from vendors looking for direction, predictions and advice. Some clone makers will offer cheap prices. Others will try to offer instantly competitive products, loaded with less integrated, but feature-equivalent goodies. Achieving a parity of features is not so tough, since most of the IBM hardware announcement was geared not to new features but to integrating features that already exist separately in the add-on marketplace.

A real issue here is whether or not IBM possesses substantial patent protection. No one will know that until the patents are issued and published. The patent situation could lead to many infringement suits when the clones come into the marketplace with PS/2-me-too products and possibly to some licensing activity by IBM.

I suspect IBM will opt for high-priced licenses to let the Compaqs and mainframe vendors (who don't sell on price) offer products but keep the box peddlers (who do) out.

• The personal computer software market will be divided. A few developers will immediately run off in pursuit of new hardware platforms in hope that a new day is dawning over a successful PS/2 product line and a few will decide the PS/2 is not going to catch on and will put their next products into 80286 or standard 80386 technology. Most will continue current projects and wait to see what happens.

• PC prices for current generation products will decrease sharply during the rest of this year.

• Apple will have a field day. When we write the history books for 1987, it will be listed as the year when IBM tried to close the PC architecture while Apple simultaneously opened it. A number of developers will find the Macintosh II absolutely irresistible. So will a number of customers.

Luckily for Apple, the software development lag is in its favor this time. Just as IBM is announcing a product that will need to wait for exploiting software, the real software for the Macintosh is arriving in the marketplace in quantity. This circumstance could offer a substantial boost to corporate Macintosh enthusiasts who are trying to convince the company strategists to make the Macintosh the second corporate standard (after the IBM PC).

And don't forget the increased productivity the IBM announcement will bring to commentators and analysts. All of those articles on monopoly marketing practices, unfair control and other standard industry nonsense will probably reappear, appropriately dusted off and redecorated.

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Hardware

CONTINUED FROM PAGE 21

can save $2 million in hardware by spending $100,000 more on programming, fine. But let's not spend $2 million more on programming to save $100,000.

The second issue Wallach's comment raises is this: What else wastes computer time? I propose a corollary to Wallach's proposition: "The computing capacity of the U.S. would go up *by an order of magnitude* overnight if people knew *what* to program."

This is the real issue. We waste thousands of CPU cycles doing things inefficiently, but we waste millions doing things that shouldn't be done at all. I mean tracking 100% of the inventory, down to individual washers, instead of the important 20%. Sending electronic junk mail because the cost is hidden to the user. Using a project planning package to draw eye-catching pictures that are then ignored in the decision-making process. Calculating outputs to 10 significant digits when the key inputs have two at best. Printing 200-page reports that gather dust until the 200-page replacement arrives a month later. You get the picture.

In government, "sunset laws" force commissions and projects out of business unless their need is reassessed. The intent is to counter the way bureaucracies go on forever.

We need a sunset law for computer applications. Before approving another penny for more hardware, MIS should find out what the existing hardware is doing. Most answers will be reasonable. But enough will be so revealing as to make the exercise worth the time.

SOFT TALK

William H. Inmon

The dual data wave: Catch it

Not so long ago, IBM was knocking on the door with DB2, telling you that IMS/DB2 was the wave of the future. The word was that "dual data base" was what you really needed. IMS would handle your production work, and DB2 — which was user friendly, flexible, relational, productive, full of "clean" code, strategic, a step toward Extended Architecture, nonprocedural, firmly founded in mathematical theory and so on — was what your end users needed for their decision support processing.

Then, with the performance jolt of DB2 Release 2, IBM miraculously discovered that DB2 could be used for production processing. Voila, DB2 was the answer to all your problems — production, on-line, everything. All of a sudden, the world was saved from the heartbreak of dual data base.

Then along came Digital Equipment Corp., eating away at IBM in one of the lesser kingdoms of the realm — the mid-range processor market. Like a

Continued on page 32

Bank: DB2 a good investment

BY ALAN ALPER
CW STAFF

NEW YORK — The Chase Manhattan Bank NA is consolidating customer information in IBM's DB2 for one of the banking industry's first large-scale, relational production applications.

After a nine-month live run, MIS officials say they are pleased with the relational data base management system's ease of use and its adaptability to coding changes.

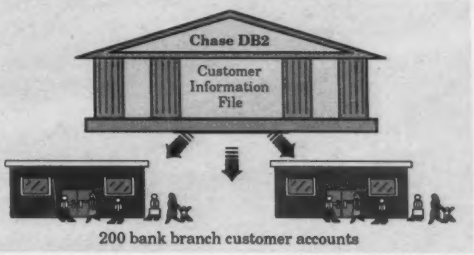
Chase Manhattan is using DB2 to manage what the bank calls a customer information file for its 200 branches. The customer information file draws on data from six separate systems — handling functions such as the processing of time deposits, loans and its bank teller system. The file organizes the information in one central repository for easy access by tellers, branch managers and product marketers.

Chase Manhattan chose DB2 over other data base management systems such as IDMS/R and Adabas, products marketed by Cullinet Software, Inc. and Software AG of North America, Inc., respectively. The decision came two years ago when some critics were calling DB2 a resource hog and a slow perform-

Continued on page 28

DB2 as a customer information data base

Data on 1.3 million accounts is used by 1,200 Chase Manhattan tellers, branch managers and product marketers



CW GRAPHIC: MITCHELL J. HAYES

VM/ISF alternative gathers steam

BY JEAN S. BOZMAN
CW STAFF

BOSTON — VM/CMS Unlimited, Inc. is repositioning its Single System Image (SSI) product as a more functional and less costly alternative to IBM's new VM/Inter-System Facilities (VM/ISF).

Until now, SSI has been sold as an economical way to combine separate IBM 4300, 3080-family and 3090 systems into a more powerful virtual system.

Based on channel-to-channel interconnects between machines, SSI delivers a single-system image for users on all linked VM machines. Installations have proved modest in the two years that SSI has been sold by VM/CMS Unlimited. To date, there are just 20 sites, which generated about $1 million in sales last year.

IBM's entry into the single-system image arena has drawn attention to another application of SSI — that of uniting separate networks of VM/CMS users [CW, March 23]. "We're very pleased that IBM announced VM/ISF because they're recognizing that there is a problem that requires a solution," VM/CMS Unlimited founder and President Romney White said.

VM/ISF is said to allow users to link two high-end IBM processors under VM/SP High Performance Option (HPO) in order to link two groups of VM/CMS users.

White said, however, that VM/ISF is an incomplete product that fails to create a single-system image for users. IBM told its customers in a product letter that VM/ISF does not create a true single-system image in

Continued on page 28

DEC opens doors on Decalc 3.0

BY CHARLES BABCOCK
CW STAFF

MARLBORO, Mass. — Digital Equipment Corp. has increased the size of its spreadsheet product and given it links to other DEC spreadsheets running on the VAX under VMS.

The number of rows and columns in Decalc, DEC's basic spreadsheet product, has been increased to 999 and 702, respectively, and a cell in one Decalc program may now be entered into another Decalc program, DEC spokesmen said.

In addition, DEC has added a forms-driven operation to the spreadsheet, allowing up to 99 different work sheets to be consolidated into one, spokesmen said.

Product manager Bob Hatcher said the linking and consolidation features in Version 3.0 "make it much easier for users to share templates and consolidate or roll up completed templates."

Version 3.0 also provides new

Continued on page 27

Inside

- PC tool analyzes source code needs for applications development. Page 27.
- Tektronix ports SA/RT tools to DEC systems. Page 33.

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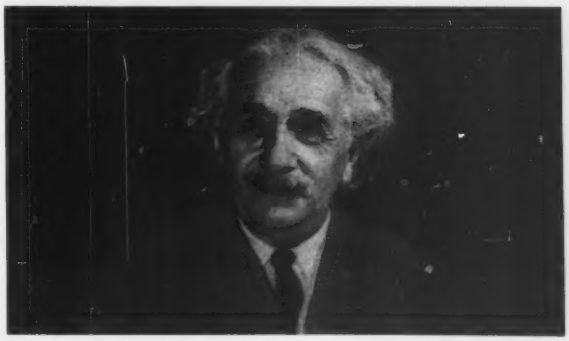

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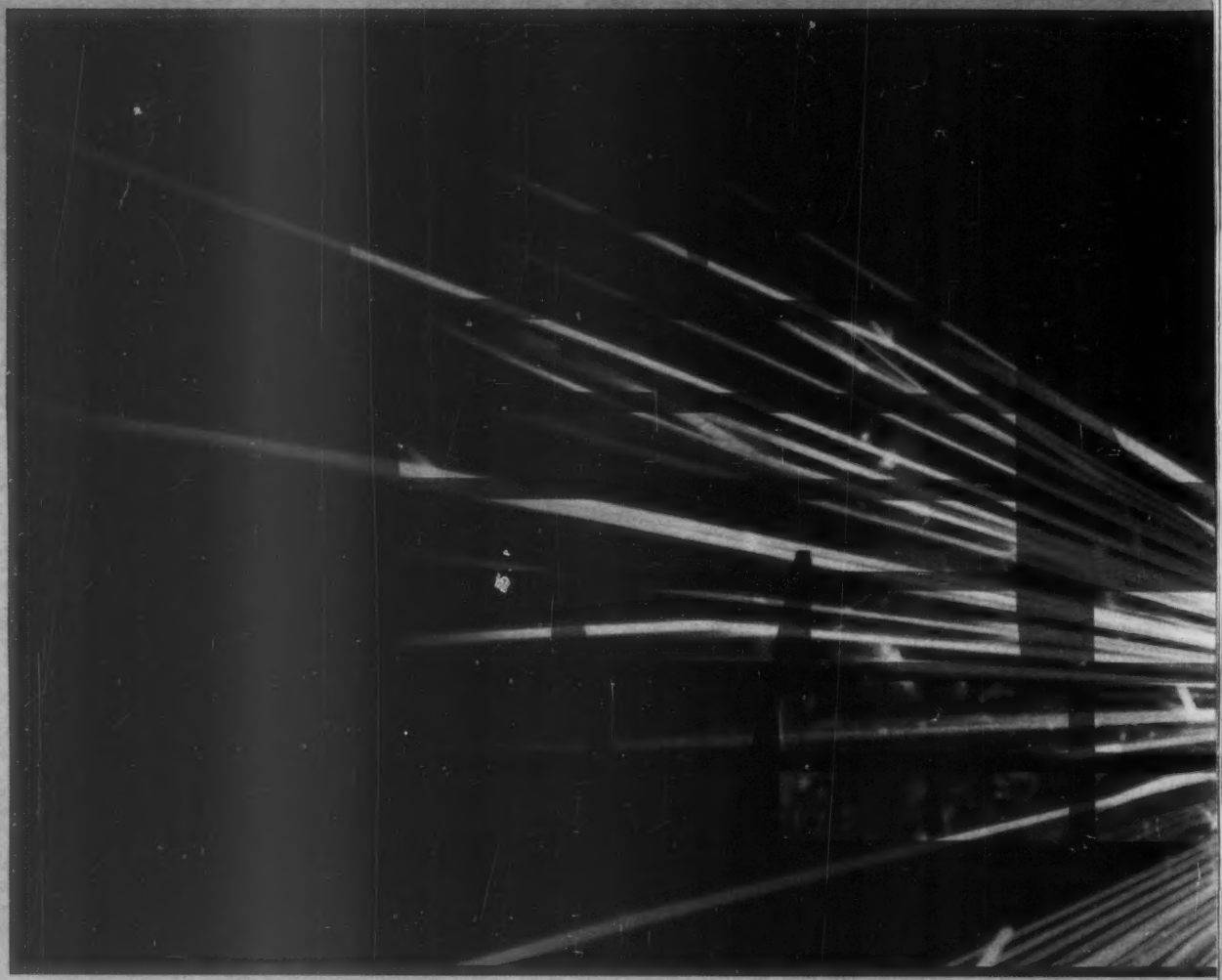

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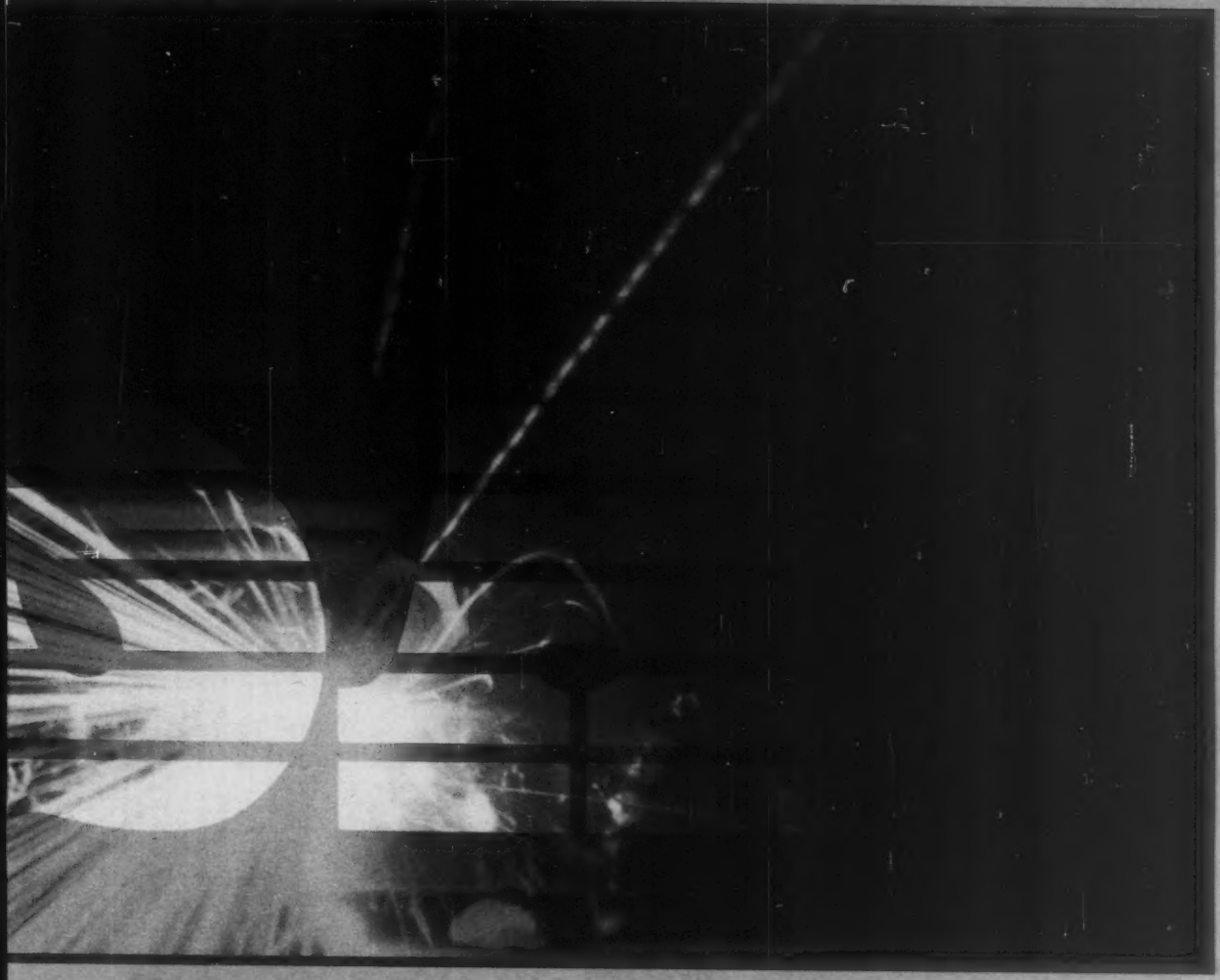

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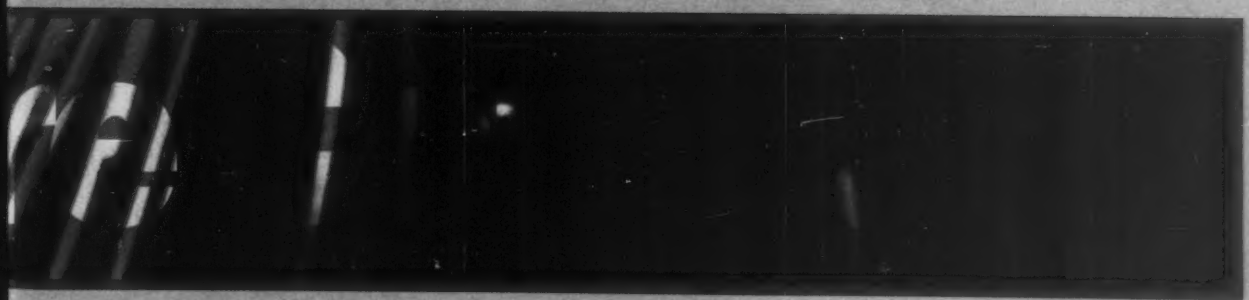

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Goal unveils VM security package

BY CHARLES BABCOCK
CW STAFF

COLUMBUS, Ohio — Security for IBM's VM operating system can reportedly be customized at four levels with an $11,480 security product released recently by Goal Systems International, Inc.

Alert/VM provides four operating modes that can be used alone or in combination to apply different levels of security, depending on the security level assigned to individual resources, Goal spokesmen said.

Security can be defined by user, terminal type, resource or terminal group. Security can also be defined on-line, using either menu-driven facilities or an English language-style rule set. On-line Help screens are provided as well, spokesmen said.

Protects logons

All control-program commands and control-program privilege classes are protected by Alert/VM. Enhanced logon protection is provided through an optional sign-on challenge to eliminate subversion of system security through exposure to Trojan horse or decoy programs designed to get an unauthorized user into the system, spokesmen explained.

Alert/VM also offers report writers to create customized reports for auditors and security administrators from the product's own data bases, Goal representatives said.

The Columbus-based firm has previously marketed security products for IBM's MVS teleprocessing monitor, CICS and VSE operating system.

Alert/VM is available under a three-year license at a rate of $287 per month as well as for the $11,480 permanent license. The product is available immediately, spokesmen said.

Decalc 3.0

CONTINUED FROM PAGE 23

commands for sorting and moving the ranges of a work sheet, a NAME command for referencing a range of cells in any other Decalc operation and offers new key sequences for moving around the work sheet more efficiently.

The DEC software works with a second product, Xway, to allow users of Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Multiplan to exchange spreadsheet models with Decalc.

Version 3.0 will reportedly sell for $1,400 on the Microvax 2000 and $10,000 on the VAX 8800.

Multiuser version

A multiuser version, Decalc-Plus, allows users to pass data between the spreadsheet and external routines.

In addition to the base Decalc additions, it provides six additional mathematical routines and allows a user to pass arguments to the external routines by reference and by value, Hatcher said.

It will retail for $5,400 on the Microvax 2000 and $27,000 on the VAX 8800. Both products will be available in June, DEC spokesmen said.

Tool estimates source code needs on micros

BY CHARLES BABCOCK
CW STAFF

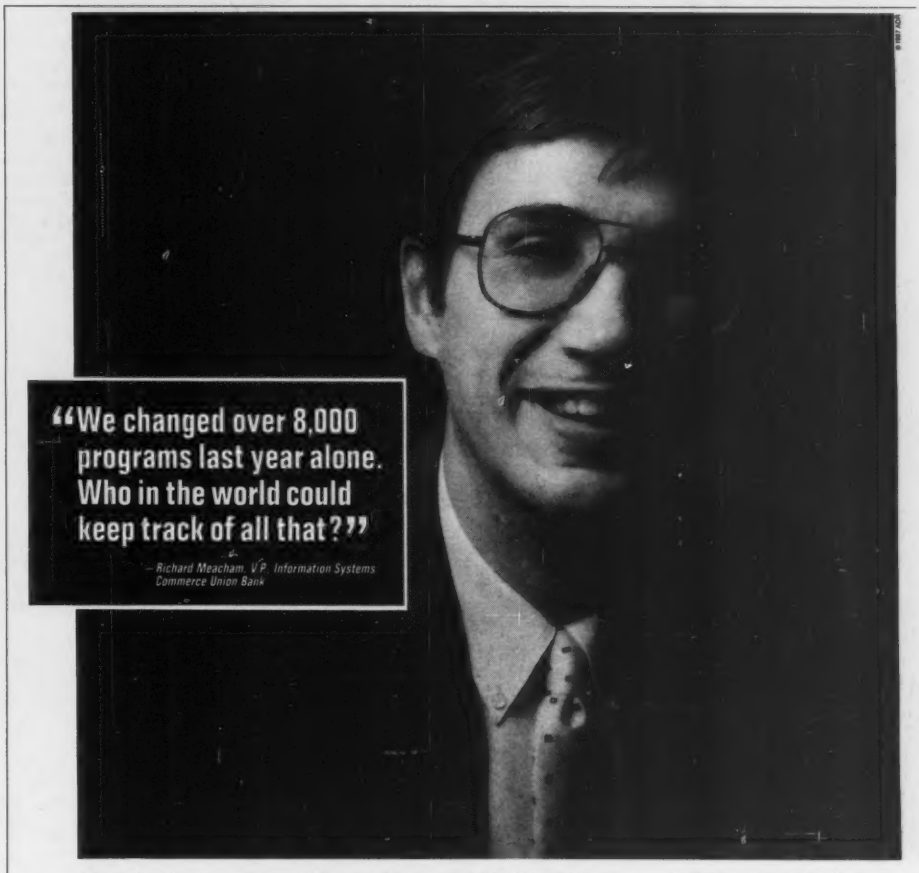
CAMBRIDGE, Mass. — A personal computer product is being offered that uses function points for analyzing the amount of source code needed for a mainframe application under development.

Sizer/FP, a $500 product from Software Productivity Research, Inc., calculates source code size from a set of parameters entered into it by the user. Wayne Hadlock, sales manager for the firm, which is based here, said a user examines the requirements and design of an application to determine such things as the number of data files, calls to other programs, inputs and outputs and inquiry screens.

From these figures, Sizer/FP estimates the number of function points required for an application and the complexity of the application. Function points were developed by A. J. Albrecht of IBM as a more accurate way to measure software development costs than simply estimating lines of code. A function point counts a particular task accomplished within a program, and the number of lines of code can vary from function to function, such as interfacing, inputs and outputs.

In addition to deriving the number of function points, Sizer/FP also analyzes the complexity of the business problem being addressed by the application, the code required and the data used. The analysis then yields an estimate of the number of lines of source needed to complete the application, Hadlock said. The final estimate can be in terms of functions points required rather than lines of source code, if the user so chooses.

The product works for software projects in 30 different languages and for projects that include a mix of more than one language. Hadlock said Sizer/FP runs on an IBM Personal Computer XT, AT or compatible and requires a minimum of 256K bytes of memory plus a hard disk.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– Richard Meacham, V.P. Information Systems Commerce Union Bank

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VM/ISF

CONTINUED FROM PAGE 23

some applications, including Profs.

"They [IBM] have used a hodgepodge of techniques to perform the various functions, whereas we have a coherent architecture," White claimed. "Theirs is not a very complete solution."

In a four-page analysis released last month, White pointed out several significant ways in which SSI differs from VM/ISF.

For example, SSI supports the attachment of up to six CPUs, while IBM's VM/ISF supports only two CPUs. And, unlike IBM's product, SSI is said to support VM machines throughout their power ranges, from low-end IBM 4341s and 9370s to high-end 3090s. VM/ISF is also said to support selected large-scale machines capable of running VM/XA, starting with the IBM 4381 and ending with the partitioned 3090 Model 400.

The Gartner Group, Inc. Vice-President Peter Levine, who specializes in IBM systems software, said he believes that SSI probably does offer more advanced functions than VM/ISF.

"Romney [White] is probably three years ahead of IBM," Levine said. "He's been working on the problem longer than they have, and he has integrated SSI into the VM Control Program, while IBM has chosen to run VM/ISF alongside CMS."

The pricing scheme is different for the VM/ISF and SSI products. SSI's pricing is charged by the complex and IBM's is charged by the CPU.

Both packages, however, can cost as much as $100,000 for high-end mainframes.

Another key difference is that VM/ISF requires the use of VM/SP HPO Release 4.2 and the VM/Pass-Through software facility, while SSI does not.

> "WE'RE VERY pleased that IBM announced VM/ISF because they're recognizing that there is a problem that requires a solution."
>
> ROMNEY WHITE
> VM/CMS UNLIMITED

White also said he believes that SSI will prove more flexible and will provide greater transparency to end-users.

"SSI automatically distributes virtual machines across the computing complex to even out the loads on the systems," White said.

"And, unlike VM/ISF, SSI allows programs on different processors to use IBM's Inter-User Communication Vehicle," White added.

IBM's Inter-User Communication Vehicle supports Profs and the Structured Query Language Data System, IBM said.

Bank says DB2

CONTINUED FROM PAGE 23

er. IBM customers were unsure whether DB2 would ever mature to the point where it could be counted on as an efficient production system.

"Since this wasn't going to be a high-volume transaction system — but an information processing system — we weren't that concerned with throughput," recalls Gary Neville, vice-president of Chase Manhattan's branch systems, which the bank calls Metropolitan Community Bank. "IBM said they were addressing those issues, and it would not be a crippling problem if they did not get to it right away."

Chase Manhattan was leaning strongly toward a relational data base and was told by beta-test users about DB2's ease of use and flexibility. "We were told if we made a mistake and eventually had to modify the data it wouldn't kill us," Neville explains.

The Metropolitan Community Bank at Chase was fortunate that it was creating a data base from scratch and conversion was not an issue. Although DB2 was an unproven technology, Neville and his colleagues say they were sure that as a pioneering user, IBM would provide the support necessary to pull the project off.

'Came into its own'

"It seemed to us that it was new technology that had finally come into its own and would start to drive the market," Neville says.

The customer information file co-resides on an IBM 3080-class machine, sharing resources with other software systems. It consists of two components: one that manages customer data for access at the branch level and another that acts as a management decision support system for the bank's product marketing staff. Up to 1,200 Chase Manhattan tellers, branch managers and product marketing personnel have access to the system at any one time.

"We wanted to position our people to deal with customers on a relationship basis rather than on a product basis," Neville says in regard to the customer information file's significance to the bank.

The information file took less than 18 months to build. Programmers used IBM's SQL, Query By Example, Cobol and in-house developed tools, Neville notes. The system tracks approximately 1.3 million customer accounts and consists of 15 tables and 9.5 million rows, says Tom Nirmaier, vice-president and program manager of the project. Each table consists of between 20 and 114 columns, he adds.

The system is currently processing 20,000 transactions a day, Neville says. "That should increase to about 25,000 a day once people learn more about the system," he suggests.

Chase Manhattan is generally happy with the system's performance. The firm upgraded the MVS/SP operating system on the 3080 to MVS/XA, a switch that "pepped up" systems performance, Nirmaier says. Approximately 80% of the system's transactions take less than three seconds, Neville says.

The management decision support system sometimes bogs down, however, according to Neville, particularly if a user asks for many pages of data. "If that's the case, the output might be done overnight; it depends on the request," Neville says.

"IBM's next release of QMF will help govern the use of the system," Nirmaier points out. "Now a user can go in and use 40%, 50% or 60% of the computing resource," he says. "The new version will restrict the amount the user can use. Although it may take longer to do the task, it will enable the system to manage resources better."

DB2's lack of referential integrity — changing one field and having it correlate with the same data in another — is of little concern to Chase Manhattan. The firm has written code into its applications to get around the problem involving referential integrity.

"It's something as a programmer you live with all your life," Nirmaier says. "In a bank, though, you're interested in audit trails, and in most cases, you put an audit trail in place anyway."

Chase Manhattan is anxiously awaiting an on-line performance monitor for DB2. "We'd love to see it because you need to keep a watchful eye on performance," Neville relates. "You can't let a system get a little worse and a little worse because eventually, it will get away from you."

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Dual data wave

CONTINUED FROM PAGE 23

woodpecker beating away on a stump, DEC pecked away at IBM. Then, wonder of wonders, IBM found the 9370 — just the solution for that pesky woodpecker. IBM wants us to believe that a VM-based 9370 is a mid-range solution.

Along with VM at the 9370 level comes SQL/DS, which is just the tool departmental managers and analysts need to unlock the power of mid-range information — primarily doing decision support processing. We don't hear a lot about dual data base anymore.

But what, if anything, is the production mainframe DB2 environment coupled with the 9370 VM SQL/DS environment? It's our old friend, dual data base. Only this time, dual data base is *tres chic* — because it is packaged differently, because IBM needs something with which to shoo away that DEC woodpecker and because the terminology has been changed.

It's a shame that dual data base — the foundation of data architecture — has had to be a pawn in a marketing free-for-all. Lost in all the hype are two very relevant and important facts:

- There is a very real difference between dual data base and dual data base management systems.
- The complex, diverse world of information processing in the 1980s and 1990s is only effectively managed in terms of data architecture. The first step that practically every shop takes toward maturity is the transition to the dual data base environment.

The chart above shows that data is constantly being pulled in two directions. The operational forces of an organization need to have a disciplined, structured use of data. Operational data must be stored at a detailed level and tightly controlled. Bank teller systems, reservation systems and manufacturing control systems all need to use data with a high degree of structure and discipline.

Trend analysis systems, ad hoc reports and demographic analysis systems are examples of unstructured uses of data — detailed and summary — in a free-form fashion. Data simply is being stretched in the 1985 to 1990 time frame as it never before has been stretched.

The proponents of a single DBMS — usually vendors — proclaim the power of their products to handle all needs for data, both structured and unstructured. This discussion is related to — but nevertheless different from — the dual data base discussion, which argues that data used in a highly structured manner is essentially different from data issued in an unstructured manner.

But even now, some DBMS vendors are trying to tell us that a single DBMS product will fit all needs. It is much more likely that different DBMS products having their own strengths and weaknesses will prosper. The DBMS that purports to be all things to all people at all times will be mediocre across the board.

But the dual DBMS is a separate issue from the dual data base.

Data architecture recognizes that there are different uses for data and different levels of data. Today, a single source of data serving all needs is unfeasible. There simply is such a diverse set of needs for data that no one processor or piece of software will satisfy all the needs at the same time.

But the theoreticians insist anything other than a single source of data will bring about the dreaded redundancy and that with redundancy of data, great cracks will appear in the earth. This, of course, is not the case. Redundancy of data is the necessary evil that allows the tug-of-war depicted in the chart to be resolved. The forces of structured processing and unstructured processing are just too strong.

The result is a need for a multilevel-data architecture. Redundancy of data is a fact of life. Using redundancy effectively is one of the great challenges of the next decade. Data architecture is the glue that holds together the forces tugging at corporate data and is the key to separating the winners from the losers.

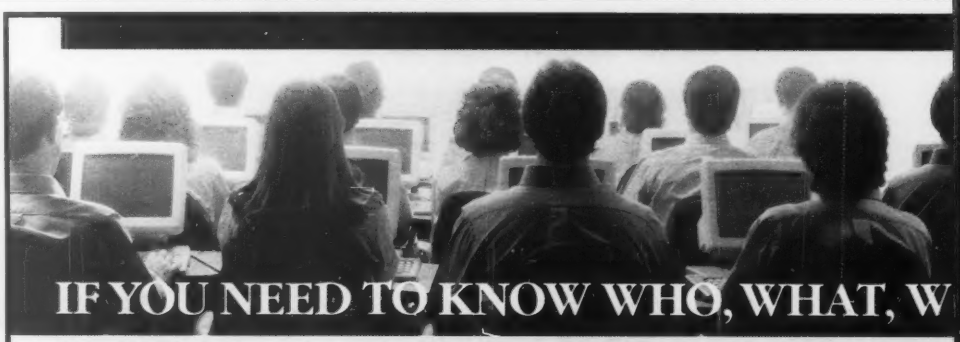
Data architecture is evolving in a hundred different ways. It is here. It is not going away. Data architecture begins with dual data base and the challenges and opportunities presented by redundancy of data. Trying to hold back data architecture is like trying to hold back the tide. Can't be done. Even by IBM.

Inmon is a senior principal with American Management Systems in Lakewood, Colo., and an author on the subject of data base design.

Dual data base need

Operational forces of an organization tend to pull data in two opposing directions

CW CHART



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NEW PRODUCTS

Systems software

Tektronix, Inc.'s Computer-Aided Software Engineering Division has ported its **Structured Analysis/Real-Time** (SA/RT) **Tools** and **Structured Design** (SD) **Tools** Version 2 to Digital Equipment Corp. VAX, Microvax II, Vaxstation and Vaxcluster systems.

SA/RT Tools are said to automate modeling of real-time systems and graphically specify systems requirements during the analysis phase. The SA/RT Tools also automatically check the specification's completeness and consistency.

SD Tools are a set of graphically oriented software development tools that automates the structured design method of software design.

SA/RT Tools cost from $5,400 to $54,000. SD Tools costs from $3,600 to $36,000.

Tektronix, P.O. Box 14752, Portland, Ore. 97214.

Corinthian Software Sales, Inc. has announced **Sourceplus Release 2.0**, an upgraded version of its VM/CMS Source Library system.

Release 2.0 features support for up to 128 libraries, library-user and command security, concurrent operation of library during scan function and multiple user-defined Includes. Other enhanced functions include the Audit Trail, archiving and direct-access storage device data compression.

Sourceplus costs $6,000. Maintenance costs 10% of the current selling price.

Corinthian Software Sales, Suite C-250, 3260 Powers Ferry Road, Marietta, Ga. 30067.

Applications packages

William A. Pedersen and Associates has announced **Graph220** business graphics software for the Digital Equipment Corp. VT220 and compatible ANSI terminals.

Graph220 is said to allow users to develop and display business graphics on VT220s without additional hardware. It runs as an application program under DEC's VAX/VMS operating system.

Features include pie, bar, histogram and line charts; interactive keyboard interface; keyboard entry and edit; the ability to import properly formatted data files; on-line Help; control over legends, titles, scales and axis display; and output to a printer attached to the terminal or to a file.

Graph220 costs from $795.

William A. Pedersen and Associates, 1037 N. Fair Oaks Ave., Sunnyvale, Calif. 94089.

Utilities

Landmark Systems Corp. has announced **Version 7.0** of **The Monitor for CICS.**

Version 7.0 includes the Cross System Monitor feature that is said to function even when CICS is stalled or disabled. It runs as a VTAM task in its own address space outside of CICS and can monitor any CICS system, even a stalled system, the vendor said.

Other features of Version 7.0 include the ability to diagnose and recover from CICS problem situations through a menu-driven system; the ability to monitor multiple CICS systems from a single terminal; and an alert system that automatically calls attention to stressed systems.

Version 7.0 of The Monitor for CICS costs $21,000 for MVS/XA and MVS/SP operating systems.

Landmark Systems, 6551 Loisdale Court, Springfield, Va. 22150.

Gemini Management Systems has announced **Infopak-DB2**, a data compression package for IBM DB2 data bases.

Infopak-DB2 uses the information contained in the DB2 catalog to allow for compression of the DB2 tables. It is said to allow designers of DB2 tables to specify fixed-length data rows instead of variable-length rows. It does not use any external tables and is compatible with DB2 back-up and recovery utilities.

Infopak-DB2 is priced at $25,000 per CPU.

Gemini Management Systems, Rahn Fountain Plaza, 42 E. Rahn Road, Dayton, Ohio 45429.

Development tools

Aspen Technologies, Inc. has announced an executable version of the Unix system command interpreter, the **Korn Shell.**

The Korn Shell is a software tool said to run with Microsoft Corp.'s Xenix and Microport System V/AT systems on IBM Personal Computer ATs and compatibles as well as on the AT&T 3B2 line of computers. The Korn Shell features in-line editing, command re-entry, command aliasing, arithmetic evaluation, compatibility, security and the ability to operate on 8-bit extended-character sets.

The AT&T 3B2 version of the Korn Shell costs $195; the Xenix and Microport versions cost $125 each.

Aspen Technologies, P.O. Box 5727, Parsippany, N.J. 07054.

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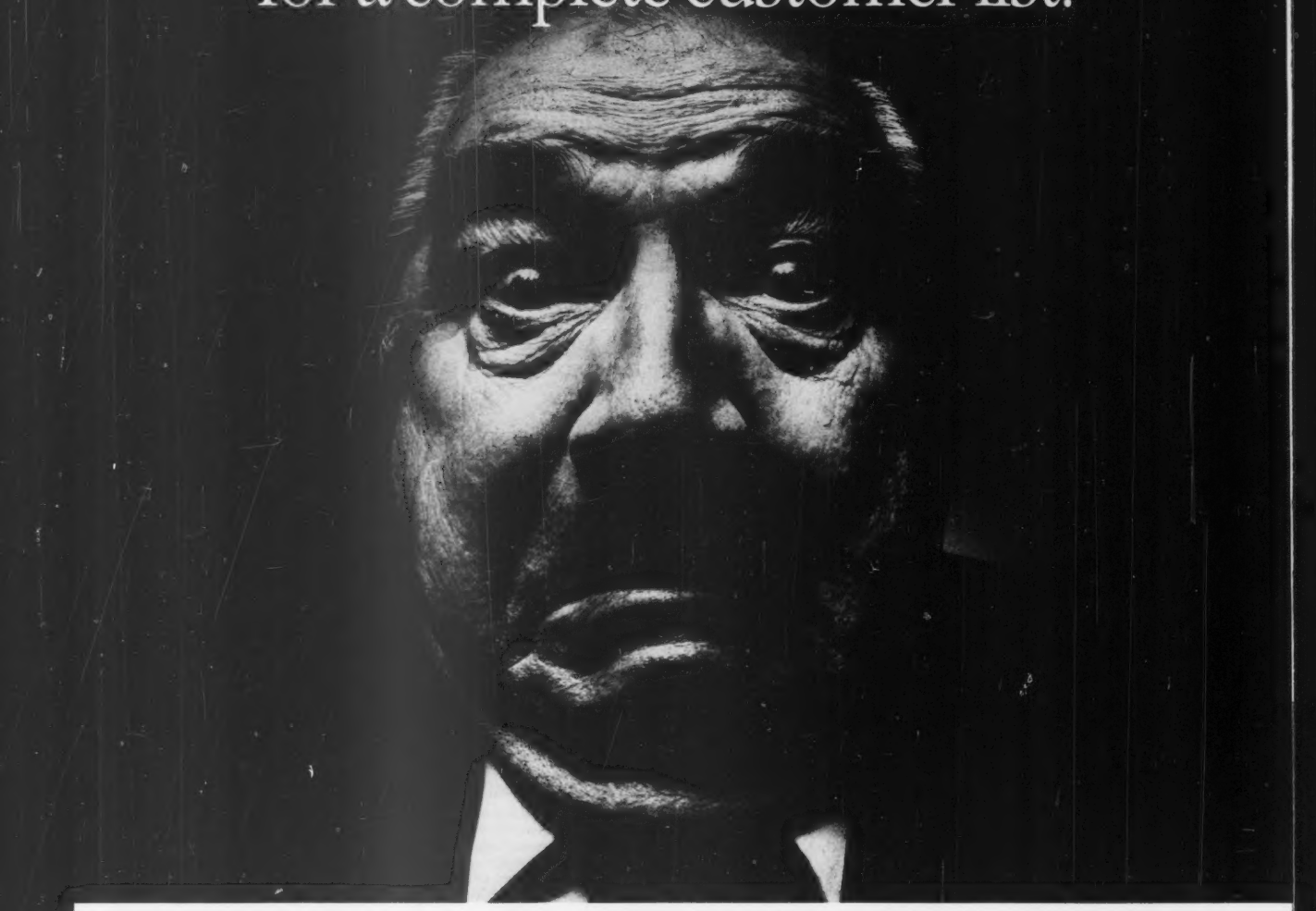
Watch what happens next time you ask a mainframe software vendor for a complete customer list.



You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

Why don't they want you to see a complete list? Simple. They know that their size and name familiarity do not guarantee happiness. Many "single source" or "all-things-to-all-people" vendors have, at best, uneven quality across a multi-application product line. They know that their customer list may contain a good number of less-than-happy clients. It's difficult for these vendors to commit the human and monetary resources necessary to produce the type of superior product available from a firm that specializes in a single application area. A firm like Data Design.

Data Design develops mainframe financial applications software. Period. We understand all our users' requirements and are therefore able to provide the necessary support: over 40 percent of our support and installation staff are CPA's or have MBA's.

Data Design doesn't balk at giving prospective customers a *complete* customer list. That's because hundreds of FORTUNE 1000 companies have reaped exceptional results from our financial software systems. Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more have opted for Data Design over other major vendors. Write for our complete customer list and ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions, and more.

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SMALL TALK

William Zachmann

Turbo Basic hits redline

Frankly, Philippe Kahn's company, Borland International, is getting to be a real problem for me. There are two reasons for this. In the first place, my reputation as a reviewer of personal computer hardware and software products would be compromised if I were to exhibit bias in favor of or against any particular vendor.

The first difficulty, then, is that Borland keeps coming up with too many fantastic products. It just isn't fair. If I ignore them, I fail to tell my readers about some of the best products delivering some of the best value on the market. With a company as prolific as Borland, however, if I cover all the good products they put out, it starts to look like I am on Borland's public relations department's payroll.

The second difficulty is that Borland's products are often aimed squarely at those of another PC software company that I admire: Microsoft Corp. In fact, Kahn and Microsoft Chairman Bill Gates are two of the most able people I have had the good fortune to encounter in this business. I hate to hint of taking sides between them even more than Woody Allen hates leaving Manhattan for a weekend in the country.

Continued on page 38

Keeping PC source code safe

Escrow offers protection if vendor shuts down, ends program support

BY PEGGY WATT
CW STAFF

When Microsoft Corp. recently battled a challenge to its ownership of the ubiquitous MS-DOS operating system, some MIS managers wondered how to protect their companies from being caught in the crossfire.

Had Microsoft not successfully retained its rights to MS-DOS, support and upgrade policies might have changed for the operating system of millions of microcomputers, including the IBM Personal Computer and compatibles. Similar questions regarding security arise when MIS manages megabytes of corporate data with applications programs that are subject to a vendor's continued support.

One option, which is of increasing interest to MIS for microcomputer applications as well as mainframe operations, is to get the vendor to put source code in escrow for release to the customer who finds himself self-sufficient for support.

'Tremendous demand'

Such protection is usually included as a clause in a site license, according to Boston attorney Peter Marx, chairman of the New England Computer Law Forum. If the vendor goes out of business or otherwise stops supporting the program, the user gets the code and the corporate staff provides its own updates and technical service. Marx said he considers the practice "just the beginning of a tremendous demand."

Its success is also largely untested, and several managers who took the plunge said they would rather be overly cautious than sorry.

"Our legal department recommended [escrow]," said Karl Kendall, manager of microcomputer support for Metropolitan Life Insurance Co.'s information center in New York. "We have part of our corporation built on some applications and cannot afford to have those yanked."

Cleveland-based accounting

Continued on page 37

UPDATE

Spreadsheets' quiet horror

BY ROBERT MOSKOWITZ
SPECIAL TO CW

One of the strongest selling points of today's spreadsheet software is ease of use. Any user, vendors claim, can learn one almost immediately and begin using it productively. But now a hidden downside to this benefit may be emerging. As millions of computerized models and spreadsheet calculations proliferate throughout organizations, human errors seem to be proliferating along with them.

Donald N. Roark, president of Intelligent Machines Training in Sherman Oaks, Calif., says, "I can immediately think of 20 or 30 cases [in various companies] where major decisions were based on spreadsheets that later turned out to contain errors. Some of the

Continued on page 39

NCR chops PC prices up to 21%

BY DAVID BRIGHT
CW STAFF

DAYTON, Ohio — Following the lead of IBM and several makers of IBM Personal Computer-compatible systems, NCR Corp. last week slashed prices on its personal computers by as much as 21%.

"We have always maintained a competitive position on pricing, and these reductions are an indication of our intent to maintain that strategy," said Vernon Yates, NCR's Personal Computer Division vice-president and general manager.

When IBM announced its Personal System/2 line a month ago, it reduced the prices of several PC family models by as much as 17%. Shortly before the IBM announcement, Hewlett-Packard Co. reduced the prices of two Vectra PC systems by 15%, and Epson America, Inc. dropped the prices of its Equity systems by an average of 9%.

Two weeks ago, AT&T cut the prices of its line of IBM PC-compatible systems by as much as 38%. The biggest cuts were made on the company's 6300

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Inside

- AST Research gets jump with PS/2 add-on cards. Page 36.
- Mac SE gets 40M-byte internal drive from CMS Enhancements. Page 37.
- CPT claims workstation allows simultaneous MS-DOS, PC compatibility. Page 41.

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AST gets jump on foes with PS/2 add-on cards

BY JAMES A. MARTIN
CW STAFF

IRVINE, Calif. — AST Research, Inc. has jockeyed to become the first third-party vendor to announce availability of add-on multifunction cards for IBM's Personal System/2 line.

Although AST said it plans to introduce enhanced versions of its Rampage and Advantage add-on cards that are currently available for IBM Personal Computers and compatibles, the company was not able to provide pricing and some other details.

Advantage/2, which is scheduled for release in August, will feature a minimum configuration of 512K bytes of random-access memory (RAM), which can be expanded to more than 2M bytes of RAM, although exactly how much more was not disclosed. Advantage/2 is aimed at the PS/2 Models 50 and 60, which come equipped with 1M byte of RAM.

Rampage/2, planned for a June release, will add from 64K to 2M bytes of RAM to the IBM PS/2 Model 30, AST said.

"Initially, we plan to leverage our current technology [by] adapting existing products to enhance the capabilities of the PS/2 family of computers," said Jim Orris, vice-president of marketing for AST.

Last week, the company ran a full-page advertisement in the *Wall Street Journal* implying it would be the first firm to provide PS/2 add-on boards, but it did not provide any information on specific products.

AST officials said the company is developing an enhancement board for the PS/2 high-end Model 80 but declined to elaborate.

The Advantage/2 multifunction expansion board will provide the extended memory that will ultimately be needed for applications running under IBM and Microsoft Corp.'s upcoming Operating System/2, according to Len Herbstman, AST senior marketing manager.

AST reported record sales of $55.4 million for its third quarter ended March 31, a 33% increase above the $41.5 million reported for that quarter in 1986.

Tecmar adds half-size EGA boards

BY DAVID BRIGHT
CW STAFF

CLEVELAND — Tecmar, Inc. last month introduced two high-resolution, half-size graphics boards said to provide total software compatibility with several IBM Personal Computer-based graphics standards.

"Our new boards are 100% compatible at the BIOS and hardware-register levels, eliminating the compatibility problems that were caused by other board makers' software emulation techniques," claimed Tecmar marketing director Dan Lucarini.

Operating with a NEC Information Systems, Inc. Multisync monitor or equivalent, Tecmar's EGA Master boards are said to provide compatibility with IBM's Enhanced Graphics Adapter (EGA), Color Graphics Adapter and Monochrome Display Adapter; Hercules Computer Technology, Inc.'s Hercules Graphics Card and Plantronics/PC & Products, Inc.'s Colorplus adapter.

Priced at $595, the EGA Master 800 card displays up to 800- by 600-pixel resolution in 16 colors.

Carrying a retail price of $495, the EGA Master 480 can display 640 by 480 pixels in 16 colors.

Each board comes with drivers for Autodesk, Inc.'s Autocad, Microsoft Corp.'s Windows and Digital Research, Inc.'s Graphics Environment Manager.

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Mac SE 40M-byte internal drive debuts

TUSTIN, Calif. — CMS Enhancements, Inc. recently announced what it claims is the first 40M-byte internal hard disk drive for Apple Computer, Inc.'s new Macintosh SE personal computer.

Dubbed the Pro-40, the 3½-in. drive is said to have an average access time of 29 msec and a data transfer rate of 1.5M byte/sec. According to CMS, the drive comes with a mounting bracket and all necessary components for installation.

The drive lists for $1,395 and is now available. Currently, the largest internal drive that Apple offers for the Macintosh SE is a 20M-byte unit listing for $999.

A month ago, CMS introduced a series of external hard disk drive subsystems for the Macintosh SE. Those drives include 20M- and 40M-byte units as well as subsystems ranging from 140M to 320M bytes.

Source code

FROM PAGE 35

firm Ernst & Whinney borrowed its policy on escrow licenses from mainframe practice about three years ago, said senior manager Walt Kennamer. "It kicks in if the vendor goes bankrupt and there's some clause about release for discontinued support," Kennamer said. "I'm frankly skeptical that it would do us much good, because most of the time you're going to be looking at tens of thousands of lines of code in any one of a dozen languages, and who knows what the technical documentation is like? But I guess I like to know the option is there."

Furthermore, a customer who seeks release of source code because of dissatisfaction with the vendor's support may prompt discussion that irons out problems, said Drew Deer, vice-president of marketing for Data Securities International, Inc., a San Francisco-based data storage firm that recently added risk assessment and escrow contracts to its services.

"The custodial license may state the vendor will fix bugs within a certain period, and if it doesn't occur, the licensee claims for release of the code," Deer said. "Ninety-nine percent of the time, the vendor and licensee come to a resolution that does not involve release."

Bankruptcy a 'bugaboo'

"You could argue that escrow gives the licensee a lever," said Palo Alto, Calif., attorney Susan Nycum, who wrote software escrow contracts in the 1960s. "The big bugaboo in this whole concept is the bankruptcy of the licenser, because the bankruptcy court has the right to call that source code an asset and cancel the contract."

Nycum recommended the licensee request source code before the vendor is actually in bankruptcy court. Despite the risks, she recommended escrow contracts for heavily used programs. "It is just prudent planning," she added.

Often, MIS managers who opt for escrow arrangements turn to providers of other data security services, such as data storage firms. Iron Mountain Group, Inc., a record storage and information management firm, added escrow of source code to its services this year.

"I can't claim to having recognized the need. Our customers put us up to it," said Bill Dreyer, vice-president of marketing. He said banks and insurance companies were the first to request the service and "only a few" have subscribed.

A custodian or escrow agent may also be a bank, savings and loan institution or specialized contractor who also receives title, attorney Marx said. Among the several storage firms that specialize in such contracts, start-up fees range from $500 to $1,000, with annual charges in the hundreds of dollars.

But, Metropolitan's Kendall pointed out, "Compared to the ramifications, it's a minor expense. If we were all of a sudden not able to be productive, it would cost us millions of dollars."

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Turbo Basic

FROM PAGE 35

Well, against that background, I am sure you will sympathize with the inner conflict I experienced after poking the blade of my Swiss army knife through the shrink-wrap on Borland's Turbo Basic. Turbo Basic, simply put, is an incredibly good product. At $99.95, it may be the best value ever offered in PC software.

To put this in perspective, let me confess that I'm addicted to Borland's Turbo Pascal. Turbo Pascal was so much better than the original IBM-labeled Pascal Compiler, for which I paid a king's ransom back in 1981, that I actually thought it might make Basic obsolete.

In fact, Turbo Pascal had a big impact on PC programming. It led to big gains in the amount of user programming done in Pascal relative to Basic. Nevertheless, Basic's inherent ease of learning and use, combined with its typically being provided free with IBM PC-DOS on nearly all IBM and compatible systems, assured Basic a continued place in microcomputer programming.

Turbo Basic is a dynamic new factor in the equation. It is far superior to the interpretive Basica and GW Basic provided with PC-DOS and Microsoft MS-DOS systems, respectively. Even more significant, however, Turbo Basic 1.0 makes Turbo Pascal 3.0 — the most recent release — look like a Stone Age relic by comparison, despite the inherent advantages that Pascal has over Basic.

Leaves Basics in the dust

Turbo Basic is a compiled Basic. This gives it execution speeds that leave standard interpretive Basics like Basica and GW Basic in the dust. Like Turbo Pascal, however, Turbo Basic also features blindingly fast compilation. Running a program in Turbo Basic easily outpaces interpretive Basics even on trivial tasks. On more complex programs, the comparisons are rather embarrassing.

Turbo Basic will run nearly all Basica source code, provided it is saved with the "A" ASCII file option. The primary difference is in its handling of floating-point values. Turbo Basic uses the IEEE standard for floating-point representation instead of the Microsoft convention used by Basica and GW Basic. Random files created with Basica or GW Basic that contain floating values need to be read using conversion functions in Turbo Basic.

In addition, Turbo Basic contains important extensions to the Basic language that make it a superset of Basica and GW Basic. Most important of these are program procedure statements supporting structures programming, including IF/ELSE, IF/ELSE/END IF, SELECT CASE and DO/LOOP. Others provide support for binary file input and output, more flexible function and procedure definitions, expanded assembly language interface options, enhanced functions and a number of new commands.

The real advantages of Turbo Basic are best seen, relatively speaking, not in comparison to interpretive versions but to Borland's own Turbo Pascal. While keeping the Wordstar-like editor (but with full support for the editing keys of the IBM Personal Computer and compatibles) of Turbo Pascal, Turbo Basic goes far beyond Micropro International Corp.'s package by providing an enhanced program development environment.

Like Turbo Prolog, Turbo Basic provides a multiwindow development and test environment. The standard screen display is a four-window environment. These include the source code and editor window, a run window, a compiler and runtime messages window and a trace window.

Good control

In addition, a menu bar across the top of the screen offers File, Edit, Run, Compile, Options, Setup, Window and Debug commands. These provide incredible control, including the ability to control various code-generation options of the compiler. Floating-point coprocessor-unique code, to give just one instance, can be turned on or off by simple menu selection. Source code may be generated in memory to an .EXE file on disk or in a linked chain of modules.

Turbo Basic sets a standard for programming languages on PCs that is the equivalent of the first running of the four-minute mile. Were it not for the fact that a production version of Borland's Turbo C is due to ship within days and the certainty of a 4.0 version of Turbo Pascal incorporating similar environmental features, I would instantly convert to Basic for all my programming.

Corporate users of Basic will find Turbo Basic a tool worth many times its cost and a quantum improvement over anything they have ever used. Selling products like this at this price is almost certain to put Borland among the ranks of PC software giants like Microsoft, Ashton-Tate and Lotus before the end of the '80s.

Zachmann is vice-president of research at International Data Corp.

NCR chops

FROM PAGE 35

Plus systems. NCR reduced prices of its high-end AT-compatible PC8 systems by 10% to 13%. A PC8 with 512K bytes of memory, one floppy disk drive and a 30M-byte hard disk drive now lists for $4,365, compared with $4,990 previously. The price of a 20M-byte hard disk model dropped from $4,590 to $3,999.

An entry-level PC8 with 256K bytes of memory and one floppy disk drive fell in price from $3,395 to $2,995. At the low end, an Intel Corp. 8088-based PC6 with 256K bytes of memory and one floppy disk drive was reduced from $2,240 to $1,775. NCR also dropped the price of its 64M-byte hard disk drive from $3,595 to $2,995.

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Spreadsheets

CONTINUED FROM PAGE 35

decisions proved disastrous."

Anyone who uses a spreadsheet can all too clearly imagine the specter of human errors magnified by the speed and power of the computer. An error — leaving out a line item or perhaps assigning the wrong formula to a cell — is passed on from manager to manager until the tainted data reaches the chief executive officer.

"You can get the same errors if you handwrite the spreadsheet," protests Jeff Ehrlich, manager of product technology for General Electric Co.'s Information Systems Division. "It's nothing new, and it's not tied to the spreadsheets themselves.

"People using PCs just have to relearn the dangers that mainframe people learned 20 years ago," he says. "There will be some of these problems until they do."

The debate

So are human errors really a problem for organizations that rely on electronic spreadsheets?

The debate is argued by three camps:

- Consultants to big business, who readily admit that their clients have serious problems with human errors distorting vital spreadsheets. This cadre loves to tell anecdotes but shies away from naming names.
- A minority of organizations making heavy use of electronic spreadsheets, whose managers maintain that such human errors are not a significant problem. They generally concede, though, the immense *potential* for such disasters.
- The majority of organizations using spreadsheets, whose managers admit human error in spreadsheets could be a major problem but believe their end users are careful and responsible enough to avoid the dangers. These managers insinuate that other organizations may be having more of a problem than they themselves are.

David Ferris is an example of the first group. Ferris is chairman of Ferrin Corp., a leading personal computer consulting firm with offices in San Francisco and Los Angeles that specializes in application development and local-area network systems integration for Fortune 1,000 firms.

'Absolutely a problem'

"These kinds of errors are absolutely a problem," Ferris says. "Almost any manager who has developed models of significant size or complexity has later discovered flaws in them. Probably 50% of them would admit it, too, if they could afford to be honest about it."

Intelligent Machines Training's Roark falls into the first group as well. "Ninety percent of the users I come in contact with do check their work and ask an associate to check it for reasonableness. But that's not 100%," says Roark, whose training and consulting company works with large and medium-size companies. Roark is also president of the Lotus Users Group of Los Angeles.

"Beginners are the biggest source of these errors," he contends. "They tend to place more reliance on the computer than is justified. One reason is usually inadequate training. It concentrates on pushing the buttons of a spreadsheet but rarely goes over the techniques of error checking."

Evidence supporting this side of the debate includes a typical horror story concerning a manager who used a spreadsheet to calculate a 6% salary increase for everyone in his department. He entered the formula incorrectly and ended up authorizing the same dollar amount for everyone.

'Not wringing our hands'

Some heavy spreadsheet users wave away these stories, however. "It's not something we're particularly concerned about at the corporate level," GE's Ehrlich says.

"If you're doing a spreadsheet, you have to know what you are doing, that's all," he says. "Accuracy is always one of our concerns, but errors of this type are not one of our overriding concerns. We're not wringing our hands over it."

Similarly, Roger Brady, manager of Financial Information Systems with United Technology Corp. in Hartford, Conn., is emphatic that his company "does not consider this a major problem, and it is not handled at the corporate level at all. Any concern for human errors in spreadsheets and prevention of them remains at the operating-unit level."

James A. Wick, director of applications planning for Lockheed Corp., based in Calabasas, Calif., more readily admits the danger: "Those kinds of errors are a problem for us. I think it is because the people making up the models are, in fact, in a prototype environment, but they don't accept that."

> "ALMOST any manager who has developed models . . . has later discovered flaws in them. Probably 50% of them would admit it, too, if they could afford to be honest about it."
>
> DAVID FERRIS
> FERRIN CORP.

Another company that recognizes the danger is San Francisco-based Levi Strauss & Co. James Wilson, previously manager of microcomputer support and now manager of Levilink Systems, suggests, "It is the same as doing the numbers on a calculator and having them typed up. There is the same potential for mistakes, and the person doing the numbers has the same responsibility to make sure they are correct."

Wilson says training at Levi Strauss stresses pinpointing incorrect formulas and techniques for checking spreadsheets. But he speculates, "Human errors must be a big problem in organizations where people don't receive adequate training."

Not paranoid

At Monsanto Co. in St. Louis, manager of information systems Michael Abbene says he perceives human errors in spreadsheets as a problem to watch for in anything beyond casual spreadsheet use.

"Spreadsheets done in financial areas and reused every month are checked for errors," Abbene says, "although I'm not sure they are checked for typos on the monthly data that is entered. We make sure people do some kind of reasonableness check, too.

"I've found myself expanding a spreadsheet and doing something wrong," Abbene adds. "Fortunately, I have either caught the error before publishing it or after publishing the results just once.

"Our concern is not at the level of paranoia," he says, "but I don't know of a lot of organizations in Monsanto that take numbers from electronic spreadsheets on faith."

William C. Jennings, an office systems analyst at the Bank of New England Corp. who does training and applications support for micro users, says, "We recognize the potential for a problem with these kinds of errors. But we heve no major program to catch them, and we don't see them as a current problem in our organization.

"In my experience," he adds, "the typos and human errors you get in most electronic spreadsheets usually don't cause a major distortion in results."

Garbage in . . .

Spreadsheet vendors, who know their products a little more intimately than the average end user, generally side with consultants in this debate.

For example, Diana Wilson, spokeswoman for Computer Associates International, Inc., says, "Anytime anyone relies on technology without checks and balances, it is a problem. If you put garbage in, you get garbage out."

Computer Associates, which markets the personal computer-based Supercalc 4 and a mainframe spreadsheet called Megacalc, recently acquired The Spreadsheet Auditor, a package that checks users' spreadsheets. "The solution is educating the end-user community," Wilson says. "If you provide them with a powerful tool that is essentially unmanaged, they can do 10 times as much damage in one-tenth the time."

Minding Ps & Qs

At Lotus Development Corp. in Cambridge, Mass., spokeswoman Janet Logan acknowledges that "human errors in spreadsheets are a problem. Lotus hasn't researched it formally, but we know informally that it is."

Logan also speaks for an auditing approach. "You definitely need to check your figures in any kind of business calculation," she asserts. "That's why there has been a real market acceptance of Cambridge [Software Collaborative's] Spreadsheet Auditor and others."

Dale Christensen, product manager for Microsoft Corp.'s Multiplan spreadsheet, also advises caution. "A spreadsheet is a really complex analytical tool," he says, "and, as with any tool, you can make errors."

Christensen identifies "a point on any large spreadsheet where you lose control." Furthermore, he insists, "Anyone

Continued on page 40

Solutions for an imperfect world

Reflecting their conservatism toward human errors in spreadsheets, vendors are rapidly incorporating the auditing concept into their spreadsheet offerings. Microsoft Corp. recently released a version of its Multiplan spreadsheet that includes sophisticated error checking routines. Lotus Development Corp. released a companion product to Lotus 1-2-3, called HAL, that provides error checking facilities.

Alexis Driscoll, product marketing manager for HAL, says, "We looked at ways to prevent people from making mistakes, but the trade-off there was [loss of] flexibility, as anyone who has purchased a precoded template should know. You can enter data, but you can't easily manipulate it. So we went the other way, to provide tools to check for errors in what users have done."

HAL offers seven error checking features for users to run against their spreadsheet models. These include ways to show users where formulas are in the spreadsheet, how ranges are used in the formulas, which cells are dependent or precedent on the active cell (where the cursor is positioned) and ways to list all cells with their formulas.

Lotus decided to incorporate error checking because, Driscoll says, "We have been hearing from our users that they need error checking features and they want them. HAL is strictly a response to the market."

Computer Associates International, Inc. denies any plans to build such features into a future release of its Supercalc spreadsheet. However, the company acquired The Spreadsheet Auditor last year to add to its product line.

Tim Gustafson, product manager for The Spreadsheet Auditor, cites several studies that show more than half of all spreadsheets contain errors. "Virtually everyone in the market admits this," he says. But he claims most errors are common, simple mistakes an auditing program can catch.

"One common error is copying a formula across a row and later typing a number on top of one formula cell. Now, when you change data, that value remains fixed," Gustafson says. "A spreadsheet auditor lets users highlight all the formulas copied from an original formula. If one cell in the row is not highlighted, users can tell the pattern has been interrupted.

"Other common errors are to reference blank cells in a formula or to specify only part of a full range," Gustafson declares. "Auditing software sees these kinds of errors and reports them, so the user can verify that is what he wants or can fix the mistake before it creates a problem."

ROBERT MOSKOWITZ

Spreadsheets

FROM PAGE 39

who says they understand a spreadsheet more than 100-times-100 cells is fooling themselves."

Part of the problem, according to Christensen, is that when people hand in the results of their spreadsheets, they do not include the documentation of what went into the models. "We tend to be much more careful about reviewing the logic of programmed applications than of spreadsheets," he says. "Nobody does code reviews of spreadsheets."

One attempt to catch these errors before they reach the bottom line is an auditing program such as The Spreadsheet Auditor and The Spreadsheet Analyst from Cambridge Software Collaborative. These packages offer features akin to the spell checkers that come with word processing software.

The auditing packages operate on the files produced by spreadsheet software, performing a variety of logic and parameter checks, displaying cell dependencies and formulas and checking range references and other potential problems (see story page 39).

SOME companies actually issue corporate policies against discussing spreadsheet errors with the press.

False security

While these features may help spreadsheet error checking, some users are unconvinced that auditing packages offer the complete solution.

"Who says the auditing software is right?" GE's Ehrlich asks. "The ultimate responsibility stays with the person delivering the answers. If the auditor helps them, it's all to the good. But there is as much danger with the auditor as without it, because it can give users a false sense of security."

Lockheed's Wick points out, "If the errors are a result of a defect in the design of the model itself — as they commonly are — it is not very likely that the audit program will catch them. It would be pretty tough to picture an artificial capability to offset an individual's thought process that is flawed or mistaken in its assumptions."

Even without spreadsheet auditing features, users can employ some simple techniques to validate their spreadsheet results. For example, most users try a check for reasonableness. They enter fairly simple numbers and perhaps vary them in predictable ways to check the results.

A variation on this is to use old numbers, in which the results are already known, and check that the new spreadsheet provides the same answers.

Another error checking technique is cross-footing — adding rows and columns that should balance out and comparing answers to make sure they do. A more elaborate approach is to perform calculations two ways in a spreadsheet and compare the answers for agreement.

Skeletons in the closet

Perhaps the most striking aspect of this topic is how few companies are comfortable discussing it; some companies actually issue corporate policies against discussing spreadsheet errors with the press.

The fundamental problem is certainly one of education. Ever since the first computer crunched the first number, users have shown a proclivity to respect computerized output much more than it probably deserves.

Today, the sheer number of PC users makes this tendency a potential nightmare, unless end users are handed a dose of skepticism and some error checking techniques along with their spreadsheet diskettes. Until training catches up with the sophistication and complexity of spreadsheet modeling, horror stories of spreadsheet errors are likely to remain a major but relatively unspoken problem.

Moskowitz is a business consultant based in Woodland Hills, Calif.

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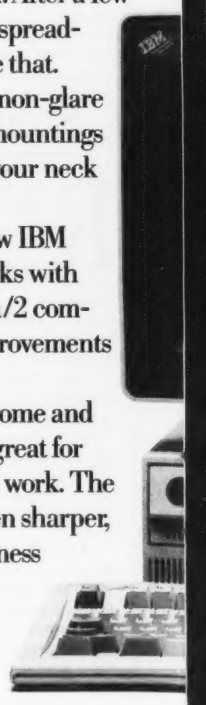

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NEW PRODUCTS

Systems

CPT Corp. has announced the **CPT 9000** workstation.

The CPT 9000 is said to allow simultaneous Microsoft Corp. MS-DOS and IBM Personal Computer AT compatibility with CPT integrated word processing. The workstation features windowing capabilities and comes complete with a full-page black-on-white monitor, 1M byte of random-access memory (RAM), 20M-byte internal hard disk drive, one 5¼-in. Hercules Computer Technology, Inc.-compatible coprocessor board with 512K bytes of RAM and AT-compatible keyboard.

The CPT 9000 is priced from $3,995.

CPT, P.O. Box 295, 8100 Mitchell Road, Minneapolis, Minn. 55440.

Lodown, Inc. has announced the **Lodown Development System** for preparing data for premastering a compact disk.

The Lodown Development System consists of a 155M- or 234M-byte hard disk, the Lodown 400M- or 800M-byte write-once-read-many times optical drive and a compact disk/read-only memory (CD-ROM) drive.

The Lodown CD-ROM Development System is priced from $11,590. The Lodown CD-ROM drive costs $1,595.

Lodown, Suite 600, 10 Victor Sq., Scotts Valley, Calif. 95066.

Software utilities

Softstyle, Inc. has announced **Printworks for the Mac** software for the Apple Computer, Inc. Macintosh.

The software is a printer driver utility program said to integrate print spooling, automatic color printing, page previewing, printing of both graphics and built-in printer fonts on the same page and even-spaced near-letter-quality text printing on Imagewriter printers. It also allows for printing on non-Apple dot matrix printers and includes the ability to print in color from object-oriented applications that support patterns.

Printworks for the Mac costs $75.

Softstyle, Suite 205, 7192 Kalanianaloe Highway, Honolulu, Hawaii 96825.

Interpreter, Inc. has announced **document conversion software** that supports Microsoft Corp.'s Word and XYWrite word processing programs.

The conversion software is said to enable the direct and fully formatted exchange of XYWrite and Microsoft documents between personal computers and dedicated word processors.

Other PC-based programs supported by Interpreter include IBM's Displaywriter II and III, Micropro International Corp.'s Wordstar and Samna Corp.'s Samna. Dedicated machines supported include IBM's Displaywriter and 5520, NBI, Inc.'s Oasys and 500S, Wang Laboratories, Inc.'s OIS and VS and Xerox Corp.'s 860, Star, 6085 and Memorywriter, according to the vendor.

Prices range from $3,995 to $25,000.

Interpreter, 11455 W. 48th Ave., Wheat Ridge, Colo. 80033.

Software enhancements

Nostradamus, Inc. has announced **Instant Replay Version II.**

Enhancements made to Version II include the ability to insert music or sound into a demonstration program or tutorial; the ability to insert user involvement into a demonstration or tutorial; improved interface menus; an enhanced keystroke editor; automatic slide show generator; exploding pop-up windows; wide-open prototyping; an enhanced Screen Genie program; and support for snapshots of both text and graphic screens.

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The IBM Personal System/2 Model 50 and the IBM Personal System/2 Color Display 8514.

The IBM Personal System/2 Monochrome Display 8503.

The IBM Personal System/2 Color Display 8513.

The IBM Personal System/2 Color Display 8512.

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DATA STREAM

Anthony J. Friscia

Give MAP a chance

Last year, bullish articles on the prospects of the Manufacturing Automation Protocol (MAP) were rampant in the industry trade press. Now MAP is back in the limelight, but the coverage is negative. The industry is buzzing with questions: Will Digital Equipment Corp. President Ken Olsen's famous speech undermine the MAP effort? Is MAP in trouble? Will the market grow as projected, at 100% this year? Will users invest in further developing MAP installations?

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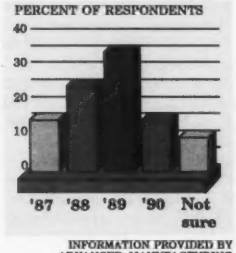
When will companies use MAP in a production environment?

Survey targets 1989 as a big year for MAP implementors



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CW CHART

LANs start getting critical care

Boom in net use demands service, support; vendor response picks up

BY DONNA RAIMONDI
CW STAFF

Local-area network (LAN) users want cradle-to-grave maintenance and support on their increasingly complex networks, a need that vendors are starting to fill.

"The size and complexity of networks has been increasing on a monthly basis for the past two years, so maintenance is much more critical than it was when we were talking about three or four PCs sharing peripherals," says Claire Fleig, director of systems research at International Technology Group in Los Altos, Calif.

At Connecticut Mutual Life Insurance Co. in Hartford, Conn., maintenance requirements are changing, says Bill Burrows, data processing officer. "Because we have a high concentration of technical people here at the home office with our own DP and building support, like electricians, we have not needed comprehensive support service," he says. "But we have a lot of remote offices throughout the country, and they do not have the DP expertise nor do they have their own electricians walking around. Most likely, when we put LANs in the remote offices, we will want that kind of service."

While LAN companies offer various kinds of support contracts, Novell, Inc. in Orem, Utah, is breaking ground with a comprehensive maintenance program it released last fall.

Novell Netware Services provides year-long contracts that, at a minimum, offer 24-hour calling, free software revision upgrades and subscriptions to a variety of mailings on technical information. An enhanced version ensures two-hour response time. A variety of options include system configuration and consulting, installation, cabling and a number of agreements for post-warranty repair and ex-

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TCP/IP group to tackle multivendor networks

BY PATRICIA KEEFE
CW STAFF

CUPERTINO, Calif. — The Internet Activities Board, in conjunction with its Internal Engineering Task Force subcommittee, has formed the Network Management Working Group (NMWG), which is composed of representatives from the Internet community and vendors of Transmission Control Protocol/Internet Protocol (TCP/IP) products.

The NMWG is a result of a recent conference on TCP/IP. Vendors of TCP/IP products met at the show and decided to form a group to address network management issues, according to Ellen Downing, a spokeswoman for Excelan, Inc. in San Jose, Calif. Other vendors represented on the panel include Sytek, Inc., Ungermann-Bass, Inc., Bridge Communications, Inc. and BBN Communications Corp., she says.

The first meeting, open to all users and vendors, is set to take place May 5 at the Techmart Silicon Valley Marketing Center in Santa Clara, Calif. Users have shown "incredible" interest in the group, according to Dan Lynch, a spokesman for Advanced Computing Environments, which provides information on network standards. "Users want to come and tell vendors what they want; they want to get their oar in the water in the beginning," Lynch says.

"In terms of users in the Department of Defense community, we're very interested in managing our networks, both local- and wide-area, which are composed of multiple vendors' products," Lee LaBarre of Mitre Corp says. "Currently, there is no single management scheme that will enable us to manage multiple products as a coherent whole as a network." LeBarre adds that there are similar ef-

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AT&T files DDS net diagnosis

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — AT&T has finally filed a tariff for a secondary channel option for its Dataphone Digital Service (DDS) after waiting more than three years for the regional Bell holding companies to introduce equivalent services that support its offering on the local level.

The option, which reportedly creates a separate digital circuit for passing diagnostic or other data between DDS customer service units, would provide users "with the same network management capabilities that dedicated analog networks have provided all along," AT&T spokesman Jim Byrnes said. For example, dedicated analog network management systems can currently perform diagnostics on a line without taking it out of service, while DDS units cannot, he explained.

AT&T has had the capability

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Inside

- System/36, 38 software translates documents into EDI formats. Page 44.
- Televideo adds LAN for small PC clusters. Page 48.
- KMW Systems supports IBM 3174 with protocol converter. Page 50.

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EDI formats ease information exchange

ACS process translates, converts documents created on different software

BY ELISABETH HORWITT
CW STAFF

CONCORD, Calif. — IBM System/36 and 38 software introduced last week by ACS Network Systems takes business documents generated by a wide variety of software packages and translates them into common electronic data interchange (EDI) formats.

The process permits trading partners to send common documents, such as shipping notices, purchase orders and invoices directly to each other's computers, even though different business software and formatting is used.

"EDI is becoming the preferred method of communicating business information between large companies and their suppliers," ACS President Lew Jenkins said.

Includes three modules

ACS' EDI software includes three modules. The communications module monitors the sessions and configures and controls access to telephone lines and third-party services. The electronic mailbox module manages the sending and receiving of documents.

The translation component converts documents to standard ANSI-defined EDI formats or takes an X.12-formatted document and converts it back to whatever format the in-house system uses.

When the system is first configured, the user defines field length, position and order and other document specifications so that the program can interface with the customer's in-house formats.

ACS is gradually incorporating optional industry-specific subsets of X.12 into the packages, noted James Bert, the company's vice-president of sales and marketing.

General Electric Information Services Co. (Geisco) is currently negotiating with ACS for rights to resell EDI/36 and EDI/38. Geisco supplies EDI products and services to several industries, including oil companies and retailers.

The latter industry "fits in well with our own apparel expertise," Bert said.

Can install both

Users can either install both business software and an EDI translation program on a System/36 or 38 or use an IBM departmental processor as a front-end translator for documents generated by — and housed on — an IBM mainframe, Bert said.

"Several of our customers just have a System/36 or 38," although some want to use the smaller system to off-load EDI translation from the mainframe, he added.

EDI/36 is priced at $5,000. EDI/38 costs $8,000.

Prices include a data communications module for any third-party network, an electronic mailbox module and the translator.

Modules also can be purchased separately. The products are available immediately.

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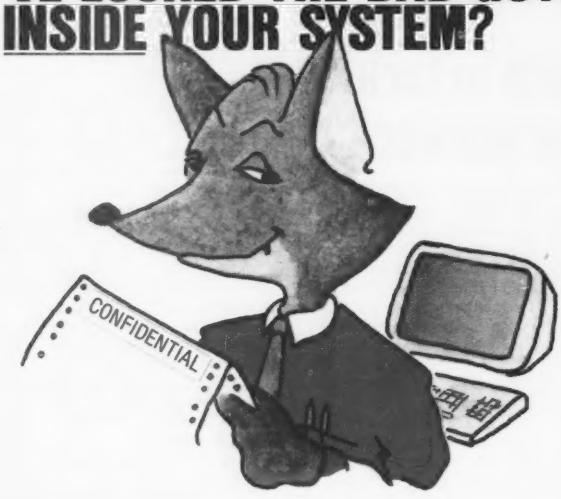

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TCP/IP group

CONTINUED FROM PAGE 43

forts in the Open Systems Interconnect area, specifically in the Manufacturing Automation Protocol/Technical Office Protocol 3.0 network management specification. "We'd like to see if we could do something similar to that," he says.

LeBarre is slated to chair the first meeting, at which he will present the ISO and IEEE models for network management.

The agenda will include discussion of the scope and schedule of the project, presentations on models for network management, TCP/IP parameters to be managed and protocols for management information exchanges.

The group will reportedly develop a set of requests for comments that define tools to manage data communications systems containing products from multiple TCP/IP vendors.

Develop a framework

The focus of the group is expected to be on detailing a framework for management of TCP/IP-based networks, the control and monitoring of information to be managed and the protocols necessary for the exchange of management information. Near-term solutions that can result in vendor implementations will be stressed.

A long-term work list for the group includes agreeing on the scope of network management and areas to be addressed — specifically, configuration, fault detection, performance, security and accounting.

The group also aims to determine the management requirements in these areas, a framework and model for network management, the parameters to be managed for each layer of the TCP/IP suite and the protocols for exchanging management information. These decisions will be documented as a set of requests for comments.

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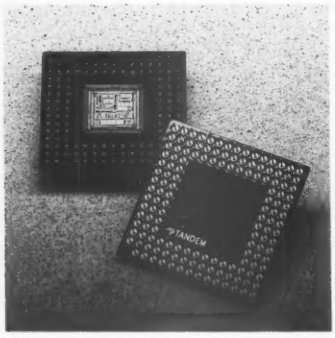

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HIGH AVAILABILITY.

Tandem is the first to bring OLTP features to UNIX systems in this price range. The system can support two mirrored disks. If one fails, the other takes over. In case of power failure, an uninterruptable power supply will run the entire system for up to five minutes. It will also send everything in memory to disk. When power is restored, auto restart resumes where you left off, maintaining data integrity.

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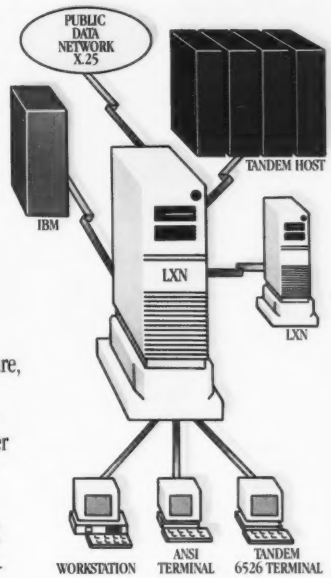
Now you can run your off-the-shelf UNIX applications and access the Tandem OLTP network—all from one workstation. The power comes from a 32-bit microprocessor. It's backed by a 1.6 megabyte floppy disk drive, an 80 or 170-megabyte hard-disk storage, and a 60-megabyte streaming cartridge tape drive.



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As you add users, add processor and memory boards. In a fully configured system, memory can expand to 16 megabytes, with 510 more megabytes of hard disk storage. LXN can support up to 32 users and take a huge workload off your mini or mainframe.

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LANs get care

CONTINUED FROM PAGE 43

change, as well as factory or on-site service.

What sets these services apart is that Novell will service any part of a LAN, not just its own components, as most network vendors currently offer. Novell claims to run more than 34 different networks.

Sometime in the next two months, the Interconnect Network Consulting Group in Pasadena, Calif., plans to release a service similar to Novell's. The service will provide network administration functions as well as support and maintenance functions, partner Mark Freund says.

"LANs are really complex systems, but a lot of people think you put them in, and they run forever," Freund says. "These are not black-box solutions; they are as complex as mainframe technology." Other companies, such as Sorbus, Inc., hint at future cradle-to-grave services but are not yet willing to talk about them.

Early mistakes

One of the mistakes people make when installing LANs in the first place is improper planning for maintenance. There should be one person in a company who serves as the focal point for any LAN problem, "even if all he does is make a phone call," Freund says.

Even with comprehensive services, there will be problems. It is unlikely that most companies could establish nationwide service organizations, so they are apt to subcontract the work. "The concept is good, but how do you control the quality of the local representative?" one service provider asks.

Users are now forced to use a variety of contracts to get full LAN service. At Connecticut Mutual, there are seven separate LANs, all based on Banyan's PC servers. The firm links anywhere from a dozen to 30 users, all on IBM Personal Computers. The insurance company has a hardware maintenance contract with Banyan for on-site, four-hour response-time service; a software contract with Banyan for automatic updates and problem solving; and in-house service for the IBM PCs attached to the LAN.

For its 3Com Corp. Ethernet boards, service is performed by Banyan only if the board is in the Banyan PC server. If the boards are in the PCs, in-house technicians replace them, Burrows says. Electricians perform cabling work.

"I have never designed or seen or recommended a network where all the pieces came from one vendor," Freund says. A company with LANs either needs lots of in-house expertise in a variety of technologies, or it needs to be able to make one phone call to deal effectively with any LAN problems, he adds.

Contract costs justified

Novell's basic service contract costs $1,800 for the first LAN; its enhanced two-hour response-time contract costs $2,600 for the first LAN. But those prices might be worth it, suggests Michael Rauch, communications manager at Standard & Poor's Corp.'s Communications Division in Lexington, Mass.

"We do our own maintenance because we are big, but for a small company it does not have a technical expert on staff, this is very attractive," Rauch says. A kinked cable in a network is extremely difficult to find, he adds. "It might take a $10,000 piece of equipment to find it. A small company would not have that."

A user at another large insurance company points out that subscribing to such a service could cause some headaches initially. "We have a maintenance contract with IBM on the IBM PCs, which Novell wants to override with a LAN service contract that would also cover the PCs," the user says. In this case, MIS and the telecommunications department normally responsible for the LAN will have to get together to decide on a course of action.

AT&T files

CONTINUED FROM PAGE 43

of offering secondary channel support on its DDS switches since shortly before divestiture but could not deliver it to end users until enough regional carriers supplied the capability on the last leg to customer premises. With the exceptions of Nynex Corp. and Bell Atlantic Corp., all the regional holding companies offer secondary channel support for their own DDS services and for access to AT&T's. Support from those last two companies is important "because users need support at both ends" of a transmission, Byrnes said.

Bank South Corp. is already using Bell South Corp.'s DDS with secondary channel support to link several member bank sites within one local access and transport area (LATA) but will probably hold off on using AT&T's inter-LATA service, according to Bud Rambo, assistant vice-president of telecommunications. The company currently uses analog circuits and network management for many of its sites, primarily because Bell South has been slow to introduce DDS in its less populated LATAs, Rambo explained. Bank South is waiting for the ability to "go digital anywhere we need to, with one type of circuitry," he added.

If the Federal Communications Commission approves the tariff on schedule, AT&T will begin offering secondary channel support on many interstate DDS circuits starting June 1. Secondary channel will be available at up to 9.6K bit/sec. capacity in all circuit configurations and at 56K bit/sec. for two-point DDS circuits.

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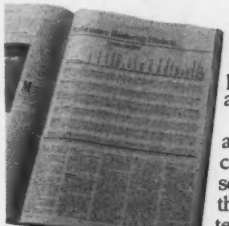

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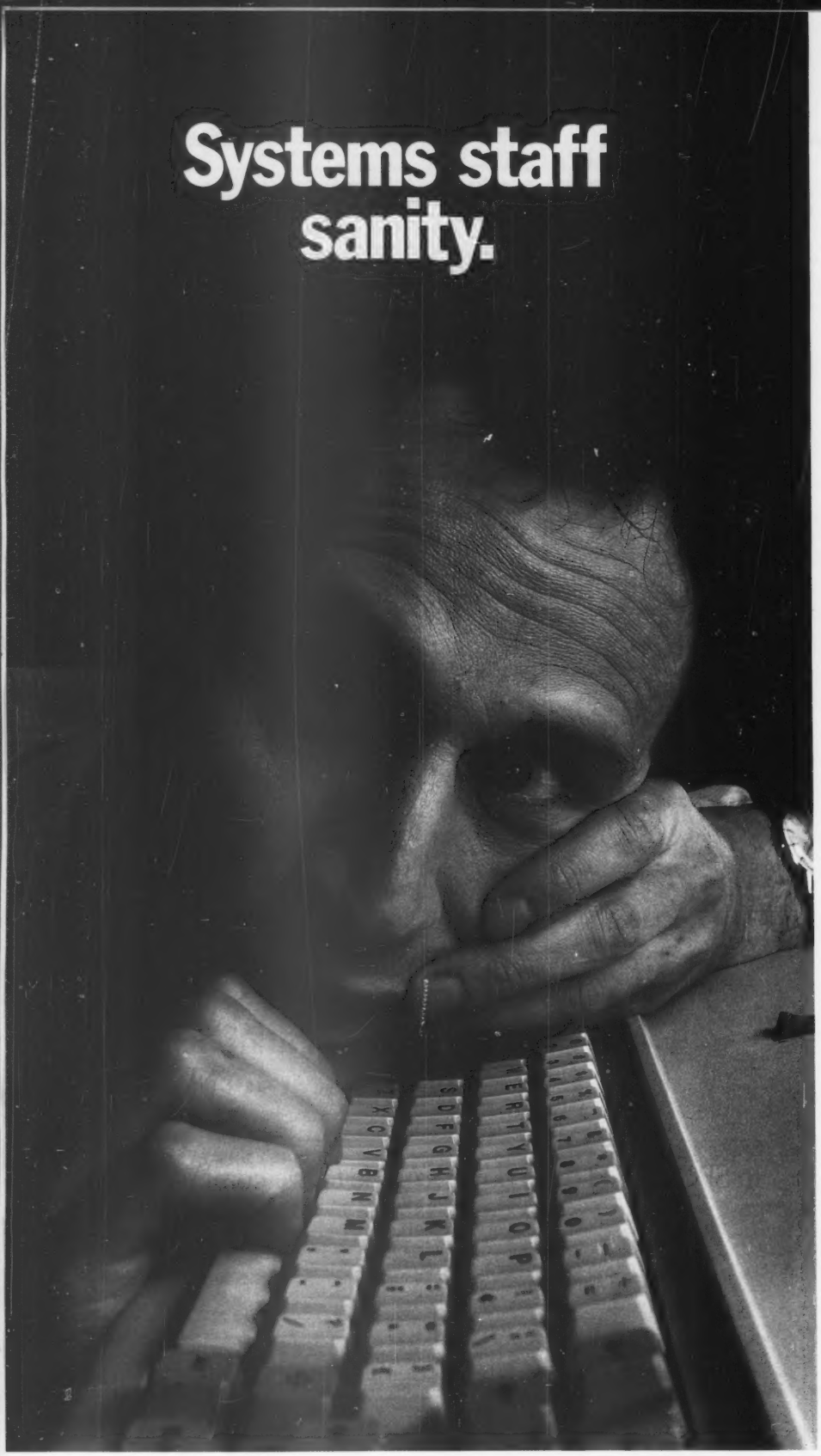

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MAP

CONTINUED FROM PAGE 43

Will vendors continue investing in the evolving specification?

The only thing the MAP market is suffering from is false expectations. Like last year's hoopla, the current death knell is premature. MAP's problem is not that there is no market, but that we should never have expected a full-fledged market to develop so quickly. MAP pioneers, in an effort to gain support, set unrealistic implementation goals. As a consequence, a developing market has been put under unnecessary pressure.

On one hand, this overzealousness has been positive. It has forced many large technology vendors — including IBM, DEC, Hewlett-Packard Co., Honeywell, Inc. and Allen-Bradley — to adopt the standard. On the other hand, premature enthusiasm may hurt the MAP effort. Advanced Manufacturing Research Co. (AMR), a Salem, Mass.-based consulting firm, recently conducted a survey of MAP users (see chart page 43).

The study concludes that until MAP 3.0 products are available and there are success stories, users will not move forward aggressively. It is apparent that anticipation of the next version of the specification is putting current purchase plans on hold.

Version 3.0: Angel of Death?

The concept of 3.0 thus sits above MAP vendors and users like an Angel of Death. Vendors that have supported MAP's development with Version 2.0 and 2.1 products will receive no return on investment from these developments. They will be hard-pressed to invest millions more into MAP 3.0. And the specter of 3.0 has paralyzed the MAP efforts of many users who have current factory communications requirements. Though a migration strategy exists, these users hesitate to gamble in their plants with an interim solution. The choice for many, therefore, is either to continue to play a wait-and-see game or adopt an alternative solution.

Long-time factory automation followers should not be surprised by slower than expected market growth. For the past six years, the "factory of the future," the supposed answer to America's industrial woes, has attracted massive press attention. However, in every case — for example, in robotics, various computer-integrated manufacturing markets and now MAP — the market has not lived up to expectations.

The reason is that factory solutions are systems solutions — involving more than just the implementation of technology. AMR has talked to dozens of manufacturing automation users during the past few months, and from these discussions, a common assessment emerged: "Making technology solutions work in the factory requires both the retraining of the work force and restructuring management. This leads to longer than expected implementation times." This phenomenon slows the growth of virtually all factory automation markets; MAP is no exception.

Since users with a current need for factory networks perceive MAP to be an incomplete solution today, they are exploring their options. Enter DEC, the company that has developed Baseway, applications packages that sit on top of the Decnet architecture and allow for communications between, and applications development for, industrial devices.

Olsen is protecting these investments. It is clear that while MAP may offer a competitive, open-standard solution two years from now, today a Decnet-based solution is more cost-effective and functional. A window of opportunity has opened, and DEC is seizing the moment — they'd be foolish not to.

Surviving the storm

If Version 3.0 is needed to drive MAP sales and the market is, in fact, two years away from developing, the real question is whether venture-funded companies can survive the storm.

From a competitive standpoint, MAP vendors are relatively stable. In the cases of both Concord Communications, Inc. and Industrial Networking, Inc., their first major installations are operational, and they are getting their 2.1 product lines in order. Manufacturing problems are getting resolved, software bugs are getting cleaned up, and the general level of experience with the technology and its application is higher than ever. The key players in the market are thus better equipped than ever before to meet users' needs.

The responsibility for these vendors now falls to the MAP organization. MAP-related events at the Autofact '85 conference, in particular the multivendor MAP/Technical Office Protocol demonstration, boosted user interest and sales temporarily and prematurely. Since that time, reality has set in at many user sites, and demand for MAP has leveled off.

Vendors can't wait until the summer of 1988 for the next injection of user excitement. If MAP is to succeed, the 2.1 vs. 3.0 issue must be resolved in the near term. User programs must be reinvigorated, and vendors must realize a return on their investments.

As the MAP organization evaluates its options, it must consider that keeping vendors healthy in this developing market (even though it is user driven) is directly proportional to the specification's survival.

Friscia is president of Advanced Manufacturing Research Co.

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NEW PRODUCTS

Local-area network hardware

Allied Data Communications Group, Inc. has introduced a family of modular broadband networks called **Mod-Lan.**

The self-contained networks are said to support broadband interfaces from most major suppliers. They support voice, data and video and meet IEEE 802.7 standards. They are compatible with both manufacturing automation protocol and IBM PC Network protocol. The networks are available in bus, splitter and riser configurations.

Mod-Lan networks cost from $3,000 to $3,500.

Allied Data Communications Group, 5375 Oakbrook Pkwy., Norcross, Ga. 30093.

Televideo Systems, Inc. has introduced the **Personal Mini PM/4T**, a file server-based local-area network (LAN) for small clusters of personal computers.

The LAN can support from four to 12 users. Clusters can interconnect or bridge to other networks. It uses star topology and features the vendor's PM/Netware 2.0A software.

The Personal Mini PM/4T with a 21M-byte hard drive, 20M-byte tape, 36K-byte floppy, 256K bytes of random-access memory and PM/Netware 2.0A is priced at $7,495.

Televideo Systems, P.O. Box 3568, 1170 Morse Ave., Sunnyvale, Calif. 94088.

Local-area network software

Waterloo Microsystems, Inc. has announced the **Port Remote Workstation**, a software program said to allow a stand-alone or portable personal computer to access services in remote Waterloo Port local-area networks (LAN).

The Remote Workstation allows an authorized user to utilize file, printer and communication services located on remote Port LANs from an IBM Personal Computer, PC XT, AT or compatible. It may also offer file, printer and communication services to remote Port LANs and to other Remote Workstations.

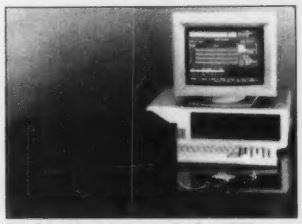
The Remote Workstation is priced at $395.

Waterloo Microsystems, Suite 200, 3597 Parkway Lane, Norcross, Ga. 30092.

Network management

Hadax Electronics, Inc. has announced its **Series 6500** network monitoring system.

The system is said to provide centralized monitoring and alarm-detection capabilities. It allows the operator to analyze network performance, assess traffic



Hadax Electronics' *Series 6500.*

areas, anticipate equipment requirements and store and retrieve information. It connects to communications equipment, digital patch fields, modems or multiplexers through a T adapter that connects to the Hadax 6500 monitoring channel port via an RJ-45 cable.

The menu-driven system operates through an IBM Personal Computer. It costs approximately $125 per RS-232 port.

Hadax Electronics, 44 Sea Cliff Ave., Glen Cove, N.Y. 11542.

Data Switch Corp. has introduced the **Galaxy-Plus**, a switching and performance-measurement system, and **Masternet 300**, a desktop control system.

Galaxy-Plus is said to allow users to identify and correct network problems and analyze network performance. It incorporates a 16-line performance-measurement system.

Masternet 300 is said to provide a single point of control for the vendor's Data Switch and T-Bar data processing and data communications switches and network-performance monitoring systems.

Galaxy-Plus with 1,280 switching ports costs about $350 per port. The Masternet 300 costs from $30,600.

Data Switch, One Enterprise Drive, Shelton, Conn. 06484.

Customer-premise equipment

Dynatech Packet Technology, Inc. has introduced the **CPX.25 series** of packet assembler/disassemblers (PAD).

The CPX.25 series Models 4 and 8 are X.25 PADs said to concentrate up to eight terminals into a single X.25 trunk. Both the trunk and ports can operate at speeds of up to 19.2K bit/sec, with clocking to the X.25 interface provided either internally or externally.

The CPX.25 series costs $2,250.

Dynatech Packet Technologies, 6464 General Green Way, Alexandria, Va. 22312.

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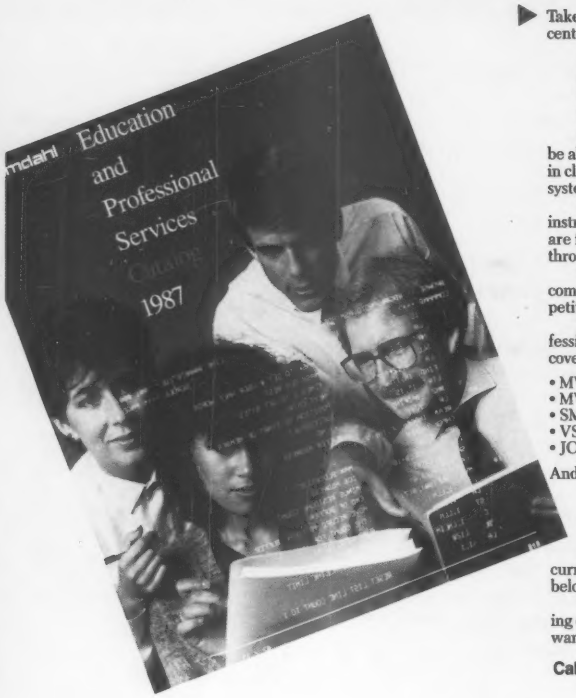

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Links

Digital Communications Associates, Inc. (DCA) has announced **Smart Alec Model 12**, a hardware and software combination that lets a personal computer emulate a remote IBM 5251 Model 12 terminal.

The product consists of a short PC card and software that communicates with IBM's System/36 and 38 via a synchronous data link control communications link.

Smart Alec Model 12 costs $695.

DCA, 1000 Alderman Drive, Alpharetta, Ga. 30201.

Information Technologies, Inc. has announced the **Linkup Coax III**, an IBM 3270 coaxial interface adapter said to support communciations between IBM Personal Computers and compatibles and the host via an IBM 3174 or 3274 controller.

Coax III is said to offer the capability to run both control-unit terminal and distributed-function terminal (DFT) modes as well as Digital Communications, Inc.'s Irma mode.

Linkup Coax II, including DFT-mode software and file transfer, costs $895.

Information Technologies, 7850 E. Evans Road, Scottsdale, Ariz. 85260.

Protocol converters

KMW Systems Corp. has announced support for the IBM 3174 control unit with the **Series II Coax** protocol converter.

The Series II Coax is said to allow a serial or parallel ASCII printer or pen plotter or a KMW Systems VP-10 Graphic Element Processor to appear to the IBM mainframe as a standard IBM Model 3287 printer.

Additional features include emulation of IBM Model 3287 front-panel controls and a transparency mode that allows output of untranslated data.

The KMW Series II Coax converter is priced at $1,295.

KMW Systems, 100 Shepherd Mountain Plaza, Austin, Texas 78739.

Modems/ multiplexers

Ven-Tel, Inc. has announced the **2400-33**, an error correcting 2,400 bit/sec. modem.

The modem is said to automatically provide both X.PC and Microport Networking Protocol error correction, allowing terminal or personal computer users error-corrected data transmission over public or private lines, commercial networks or through a protocol converter across a synchronous network.

The 2400-33 modem is priced at $749.

Ven-Tel, 2342 Walsh Ave., Santa Clara, Calif. 95051.

Fibronics International, Inc. has announced the **FM 1500** and the **FM 1508** data multiplexers.

The FM 1500 is a custom very large-scale integration-based, 32-port data multiplexer/demultiplexer for use within an IBM data entry, Category A environment. As many as 32 peripheral devices may be connected to an IBM 3174 or 3274 controller via a single- or dual-fiber-optic coaxial or twisted-pair cable.

Prices for the FM 1500 start at $2,200. The FM 1508 starts at $1,000.

Fibronics, Communications Way, Independence Park, Hyannis, Mass. 02601.

Universal Data Systems, a unit of **Motorola, Inc.** has announced the **Universal V.32 Dial-Up** modem.

The modem was designed for full-duplex operation over dial or two-wire leased lines at 9.6K and 4.8K bit/sec. It is said to be compliant with the CCITT V.32 recommendation and is capable of synchronous and asynchronous operation.

Features include an adaptive echo canceler that compensates for changes in amplitude and delay distortion and a trellis-coded modulation scheme at 9.6K bit/sec. for error detection.

The Universal V.32 Dial-Up costs $2,495.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805.

This is Motorola's newest super-microcomputer.

Motorola's System 8000 Model 100 features the MC68020 microprocessor, six-slot VMEbus chassis, high performance disk drives and streaming tape backup for one to eight users. For more information, call 800-262-4488, ext. 746. In California, call 800-252-4488, ext. 746.

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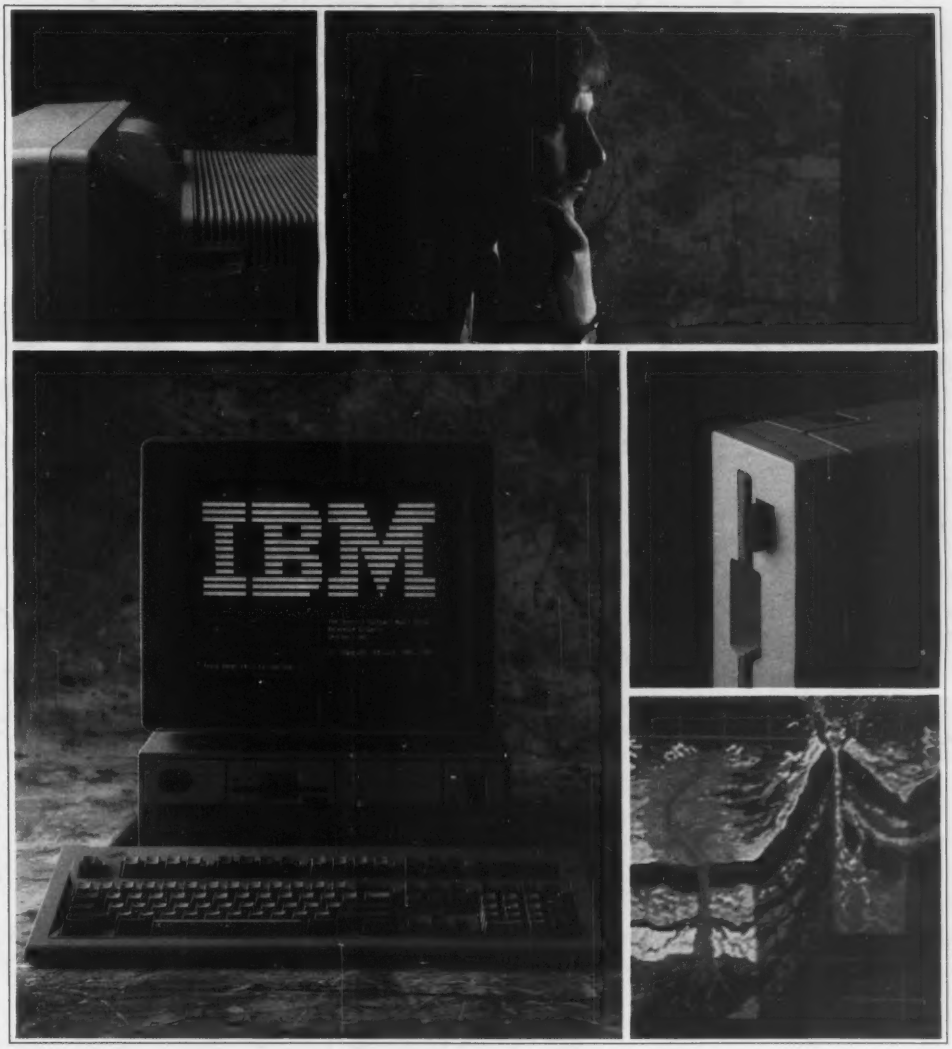
SPECIAL REPORT

IBM'S PERSONAL SYSTEM/2

The next PC generation: Machines for MIS



- **IBM bids for the corporate PC dollar**
- **Putting together the pieces of OS/2**
- **Hands-on review of the PS/2 Model 50**

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INSIDE

High Capacity
New 3½-in. floppies offer plenty of benefits — if you're willing to put up with conversion hassles. Page SR4.

MIS Pitch
IBM is targeting the Personal System/2 series directly at large corporations. But volume buyers will find that the new PCs are really a mixed bag. Page SR8.

Breathing Room
Even though OS/2 will not be available for nearly a year, developers already predict the operating system will usher in a new era of applications software. Page SR11.

Host Links
IBM expects its OS/2 Extended Edition will let PCs do what they do best while maintaining a seamless link to minis and mainframes. Page SR11.

Board Room
Enhancement board makers are racing to build products for the Personal System/2 series but do not see dramatic new uses for add-on hardware in the near or immediate future. Page SR16.

Interview
PC chief William Lowe says the power of the PS/2 is just beginning to be tapped and that MIS organizations should take steps now for future generations of hardware and software. Page SR17.

Network Options
IBM's emerging connectivity road map shows the Token-Ring network as the highway and OS/2 as the vehicle to move between incompatible systems. Page SR19.

Another Jr?
William Zachmann reviews the Personal System/2 Model 50 and says the low-cost machine is no bargain. Page SR21.

Cover photo: O'Connell/Ladouceur. Computer graphic courtesy of IBM.

MIS says yes to IBM's second generation

BY MICHAEL SULLIVAN-TRAINOR
CW STAFF

Despite reservations about the compatibility of IBM's new Personal System/2 with their current installed base, MIS managers surveyed by *Computerworld* are by and large putting their trust in the company. The more than 100 managers surveyed in the informal telephone poll said that an average of 39% of their personal computer purchases throughout the next 12 months will be from the PS/2 line.

While their ultimate commitment hinges on obtaining more information about the system, the managers said they are going to invest in the new line even though the operating system is not scheduled to be available until early 1988.

"Unless Compaq and the other competitors begin to offer comparable products, the general direction in the MIS world is going to be toward this new platform of software and hardware, mainly due to the ease of integration of the PS/2 with current departmental systems and mainframes," said Vito Battaglia, MIS manager for Borg-Warner Automotive, Inc. in Bellwood, Ill.

Another advantage of the new system is its ability to reduce investments in add-on boards, some managers said.

"The appealing part is that the Personal System/2 may be an opportunity to standardize what we have because the add-on features are built-in," said Carl Bond, vice-president of the information systems division at Farm Bureau Insurance Group of Michigan in Lansing.

However, other managers are skeptical as to how easy it will be to connect the new system to their present hardware.

Specifically, Harry Leopold, manager of end-user automation for Kemper Group in Long Grove, Ill., said he wants greater PS/2 connectivity with the IBM System/36 and 9370 families, including easier standard and physical connections.

Popularity poll

Asked to rate the PS/2 based on what they have heard about it so far, the managers gave the system mediocre marks for compatibility — rating it at 3.2 on a five-point scale — and high marks for service and support — 4.1 on the same scale. Price/performance and communications scored between the first two criteria — both rating 3.8.

A major criticism of the PS/2 line's compatibility with its personal computer predecessors is the fact that all the newly announced models feature 3½-in. drives as opposed to the standard 5¼-in. "The difference in media between the new and existing machines makes the PS/2 a hassle to work with," said Kathryn Barley, manager of the data administration and information center at Best Products Co. in Richmond, Va.

Ted Smith, manager of systems development for Union Carbide Corp. in Danbury, Conn., said that his end users would have to use an external 5¼-in. drive to accommodate the new system. "You can buy an add-on for conversion, but that is less than appealing. Our systems are based on 5¼ inches, and an awful lot of software here is in that format," he said.

Asked whether the system would give them more control over personal computing, managers responded very differently. Rating the system on a five-point scale, they indicated that PS/2 would provide somewhat more control — scoring it at 3.3.

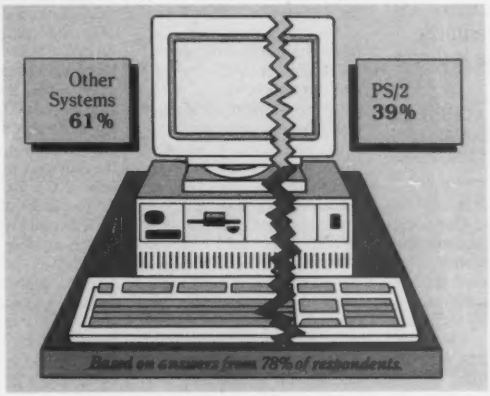
"MIS is going to gain a lot more responsibility because the system is [designed to be] connected to a mainframe. That's the market that IBM is really after," said Adair Waldenberg, director of administration at Northwestern University in Evanston, Ill.

Theodore Tansi, vice-president of information systems at Phoenix Mutual Life Insurance Co. in Hartford, Conn., said that IBM's software rather than the PS/2 hardware will dictate the

Continued on page SR4

Planning for the Personal System/2

What percentage of your PC unit purchases during the next 12 months will be the new IBM Personal System/2?



INFORMATION PROVIDED BY A *COMPUTERWORLD* SURVEY OF 101 MIS MANAGERS.
CW CHART: MITCHELL J. HAYES

Microfloppy conversion blues

BY JAMES A. MARTIN
CW STAFF

For many users, IBM's introduction of the 3½-in. microfloppy disk drive in its Personal System/2 line is both good news and bad news. Although the 3½-in. disks are smaller, more durable and offer greater storage capacity, not all personal computer applications are available in the 3½-in. format, and fewer still come on the 1.44M-byte diskettes used by the PS/2. In addition, some users are wondering what they are going to do with all the data stored on their 5¼-in. floppies.

"All the investment we have in the 5¼-in. disks is down the drain," said Alex Quintana, DP manager for First National Bank of Florence, Ala. "Now we have to go through the conversion process and the extra expenses that will create. Our micros will be obsolete, and so will the floppies that went with them."

> "ALL the investment we have in the 5¼-in. disks is down the drain."
>
> ALEX QUINTANA
> FIRST NATIONAL BANK
> OF FLORENCE, ALA.

Quintana agreed that the 3½-in. microfloppies are an improvement in technology but adds that when IBM changes standards, it means more work for MIS. "We have thousands of 5¼-in. disks, but we would only need to convert maybe 15% of the information stored on those disks," he said. "But even so, there is a burden on the user, no matter how much needs to be converted."

Many users and observers, however, said they believe the advantages of the smaller medium will far outweigh the disadvantages. "The conversion issue is really a nonissue," said Jerrold Eisen, president of Office Sciences International, a consulting firm in Iselin, N.J. "We've never seen a case where more than 10% of the information stored on one medium needs to be converted to the newer medium."

In an era when more and more microcomputers feature hard-disk storage and are often linked by local-area networks (LAN), the need to physically remove a floppy disk from one micro and place it into another is rapidly diminishing, Eisen said. "Mainly, floppy disks are going to be used for personal storage," he said. "The floppy disk is really becoming a means of portability and not primary storage."

To perform the actual conversion, IBM is offering three methods: a standard IBM printer cable to connect the 5¼-in. floppy-disk micro with the 3½-in. microfloppy PS/2, an external 5¼-in. drive that can be attached to a PS/2 or an external 3½-in. microfloppy drive that can be connected to an IBM Personal Computer or compatible. In addition, data can be sent from one format to another through a microcomputer LAN or IBM's Token-Ring network. Still another solution is uploading the data from an IBM PC AT, for example, to a host system, then dowloading from the host to the PS/2.

Most users expressed more concern about software availability on the 3½-in. format than about 5¼-in. compatibility. Software companies will have to offer products with both formats, raising the costs involved in software publishing and, ultimately, in software purchasing.

3Com Corp., for example, recently announced that its 3+ software would be available for the PS/2 in June, while the 5¼-in. format would continue to be supported. "We have two choices," said Robert Bressler, vice-president and general manager at the Software Products Division of 3Com in Santa Clara, Calif. "We can put out two products, one on 5¼-in. formats, the other on 3½-in., or we can put both sizes in one box."

Bressler said the latter option was ultimately more economical because it will not require extra marketing and record-keeping efforts. In addition, the cost of offering both formats will increase the cost of publishing software only as much as the cost of the 3½-in. disk itself, he said. "For higher end software, this isn't much of an issue," Bressler said. "But if you're selling an inexpensive disk utility for $49 and you are faced with publishing for software on both formats, the difference in costs becomes much greater."

MIS

FROM PAGE SR3

amount of involvement MIS will have with the system.

"Because of the complexity of the operating system, it will take a great deal more support from the technical staff," Tansi added, "although it may give users more freedom to do applications locally."

Overall, the managers said they are very interested in the new operating system — Operating System/2 — particularly OS/2 Extended Edition, which offers mainframe IBM DB2 compatibility, built-in terminal emulation and a much larger memory space. Even though a delivery date for the system has yet to be announced and additional memory and a mouse will be required, the managers say that more than 45% of the users of their Intel Corp. 80286- and 80386-based systems will eventually be using OS/2 Extended.

"It gives the users the capability to access the mainframe and that's the majority of what our users want to do," said Douglas Budd, director of DP at Parfumo de Coeur in Stamford, Conn.

On the other hand, some managers are reluctant to consider the new operating system because they already have an operating system that does the job.

"Unless there is a radical change in the way we use PCs, OS/2 will not be a major factor for us. We have major bridges built with [Microsoft Corp.] MS-DOS. I'm not going to rebuild them," said Dave Dandro, vice-president of information systems at Einhart Corp. in Hartford.

By the same token, 77% of the managers said they will not consider an alternative to the Microsoft-standard operating system, but instead will wait for OS/2. The few who say they will consider another system that offers multitasking and large memory space also say that such a system would have to be MS-DOS compatible. The only alternatives specifically mentioned were Unix or Microsoft's Xenix.

Indicating that the new system may not be the clone buster many have expected it to be, slightly more than half the managers said they will buy the same number of IBM PC-compatible computers as they did before the PS/2 announcement. Twenty-three percent said they would buy fewer. Among those who will buy fewer compatibles is Larry Wheeler, director of MIS at Zacky Farms in Fresno, Calif. "I want to stick with IBM. For a couple more bucks, I can get compatible systems for my network," he said.

The managers gave a lukewarm rating to the new system's graphics user interface based on Microsoft's Windows, rating its value to end users at 3.5 on a five-point scale. While some commented that users "love it," others complained of the "bittersweet" trade-off between the enhanced graphics capability and the degradation and large amount of memory that Windows requires.

In an open-ended question that invited managers to list enhancements that they'd like to see to the PS/2 and PC lines, the managers overwhelmingly voted for better connectivity between the mainframe and the personal computers.

"I still think they need to address upward connectivity," said Zacky Farms' Wheeler. "I know they're starting to. And they should make sure they don't leave out the System/38."

Warren Camp, supervisor of information services at Tenneco Oil P&M in Chalmette, La., agreed. "In particular, the [PS/2] systems line needs some way of allowing users to cull selected data from a file on a mainframe and download it to the personal computer," he said. "By itself, terminal emulation isn't enough because users can't download an entire file."

Out in the cold

Other managers mentioned the need for applications development tools and a portable Personal System/2, while still others are concerned about how the PS/2 can be integrated with their current PC network.

Paul Tumolo, manager of information center and institution support at California State University at Hayward, is concerned about installing the PS/2 with his current base of PCs.

"I don't think IBM will be cost-competitive with the PS/2. The features don't seem that great to us without an IBM mainframe," Tumolo said. "They are ignoring the small people like us — we're left out in the cold — if we had an IBM mainframe, we would certainly give some thought to it."

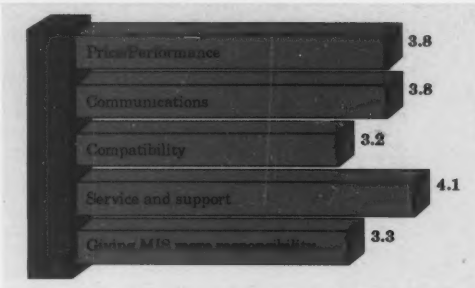
Other managers said they want lower prices and quicker delivery. But if the PS/2 is as compatible as IBM claims and provides support for standards like Lotus Development Corp.'s graphics, then many of the managers would be satisfied.

"If the claims are true, then IBM has completely satisfied all my requirements," said Ronald Blystone, director of MIS at Harsco Corp. in Camp Hill, Pa. "That's the first time that has ever happened to me with IBM." •

Senior writer David Bright compiled survey results for this report.

Rating the Personal System/2

Based on what you have heard about the new machines, rate them on a scale of 1 to 5 (1 = lowest, 5 = highest)



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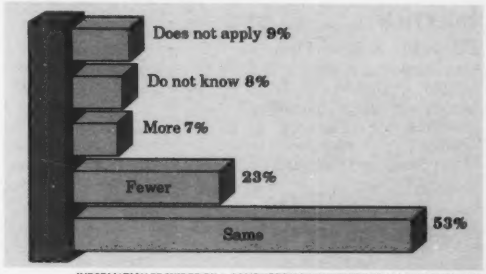
CW CHART

Personal System/2 impact on clone purchases

Will you buy more, fewer or the same number of IBM PC-compatible computers as you would have before the Personal System/2 announcement?



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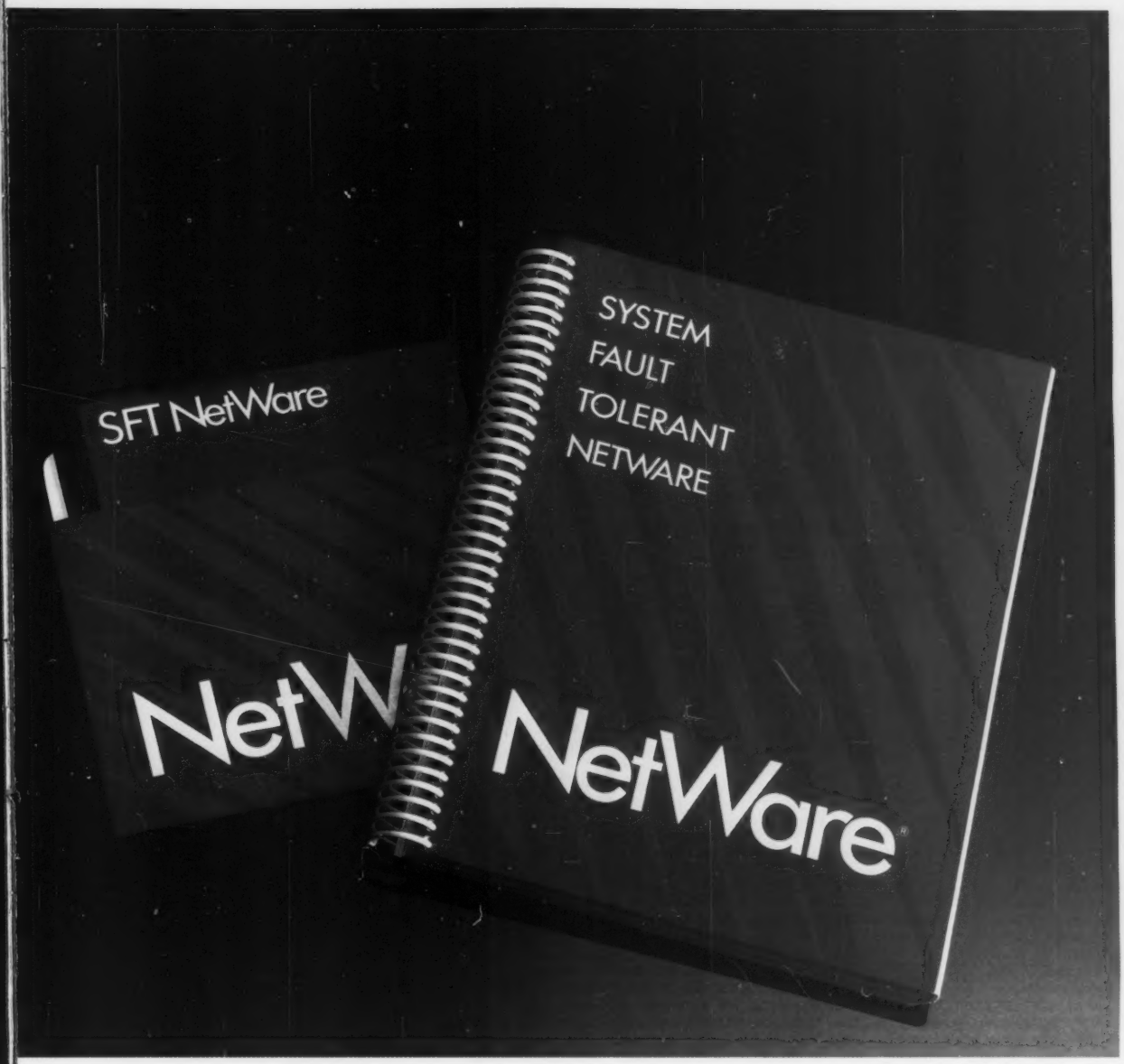

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Surrounded by his new family *of microcomputers, William C. Lowe introduces the next generation.*

BY ED SCANNELL
CW STAFF

The setting for last month's unveiling of IBM's Personal System/2 series looked more appropriate for the "Solid Gold" dancers than for a major announcement from the world's largest computer company. Amid a laser light show and blaring pop music, the president of IBM's Entry Systems Division, William C. Lowe, raised the curtain on his firm's next generation of microcomputers in front of 3,000 applauding users, developers and dealers.

The reason for such uncharacteristic flamboyance on IBM's part was to create early and enthusiastic support for its PS/2 family, which is IBM's attempt to redirect the microcomputer standard the company has fostered for the last several years. IBM is aware that without the support of key corporate accounts and manufacturers, its Micro Channel architecture may be just another alternative to the current standard established by its Personal Computer series.

Upon first examination, IBM appears to have done a masterful job at both redirecting the standard and keeping it compatible with the enormous base of existing DOS-compatible applications. While the new architecture causes corporate users and independent developers some problems on the hardware side, most are satisfied with the technological approach that IBM has taken.

"I think IBM has really done it right," said Robert Corr, director of strategic planning for Electronic Data Systems Corp. "There are some minor aggravations, but overall, IBM did an outstanding job of coming up with some high-performance machines and defining some good standards, particularly in the graphics area."

Nothing magical

Like Corr, many MIS and micro managers have given favorable reviews to the price/performance characteristics of the Personal System/2 series. However, many are also reserving long-term commitment until IBM delivers the operating system, communications products and, perhaps most importantly, applications software that will allow the machines to realize their full potential.

"It's all good stuff they have announced, and we'll probably buy thousands of them. They have reduced prices on them, which translates into significant cost savings for us," said Jeff Ehrlich, manager of product technology for General Electric Corp.'s Information Systems Division. "But there is no need to assume anything magical or mystical about these machines yet."

IBM will have to convince MIS managers of the magical qualities of the PS/2 line if it is to become the next corporate microcomputing standard. Some think that magic lies not deep in the bus but rather in the sales pitch IBM will make to MIS managers. In essence, IBM will tell MIS managers that the PS/2 series, with its promise of sophisticated communications abilities to larger systems, gives them more control over microcomputers and therefore more control over their company's data.

"[The PS/2 series] plays to what it is the DP manager wants to do. We've shown them to a number of our customers and large accounts, and they have expressed a lot of interest," said Ed Kfoury, vice-president of research and development for

IBM's Entry Systems Division.

Micro managers outside of the MIS world feel that MIS has little control over microcomputers anyway and will gain precious little with the Personal System/2 family. Many micro managers in large corporations admit that IBM will go around them and sell to MIS managers but that it will be difficult to do so without the approval of the microcomputing staff.

"IBM will realize that we no longer live in a mainframe world where the MIS director is king. I think they'll discover that the people controlling the purchasing process are at much lower levels in the user community," said Alan Gross, a spokesman for the Microcomputer Managers Association in New York.

IBM's decision to create the Micro Channel architecture was driven by the need to make its systems run faster and more efficiently. Not only has IBM increased the speed of the processor, but more important, it has come up with a "balanced systems design" that better accommodates faster peripherals, according to IBM officials.

"It doesn't make a lot of sense to take a 400-horsepower engine and put it on bicycle tires with a 10-gallon tank," Kfoury said. "People put too much emphasis on the speed of the engine and not on the overall balance of the system."

Another goal of the Micro Channel architecture was to make the systems smaller and more reliable. The new architecture affords IBM the chance to incorporate state-of-the-art technology such as surface-mounted processors, 1M-bit memory chips, new hard-disk adapters, serial and parallel ports and graphics chips — all planted on a newly designed motherboard. Consequently, the Personal System/2 products are between two and three times more reliable than existing Personal Computer ATs, IBM said. The systems will be manufactured in IBM's Boca Raton, Fla., facility, which can produce a Personal System/2 in less than a minute, according to Kfoury.

While these advances in technology and manufacturing result in lower cost, more efficient systems, it has created some problems. Perhaps the biggest problems center on the 3½-in. disk drives and 1.44M-byte diskettes, which are standard in the Personal System/2 series (see story page SR4). With the vast majority of their users' information stored on 5¼-in. floppies, MIS and micro managers envision spending hundreds of hours locating, cataloging, converting and delivering disks to users.

"I think the 1.44M-byte diskette is a faux pas on IBM's part," EDS's Corr said. "In today's world, diskettes are either a software distribution media or data transfer media. The last thing we need is another format change for diskettes."

MIS managers also complained that the disk drives are too slow and too expensive. Because they are not sure if they can get PS/2 models without IBM's disk drives, some MIS managers said they are considering buying less expensive, higher performance disk drives.

The other major problem created by the new architecture is that it will not accept existing third-party add-on boards. Several MIS managers said they have traditionally preferred the superior price/performance abilities of third-party board vendors.

"We like IBM's computers, but we don't buy IBM boards, because most third parties make better ones," said Ron Goldfarb, manager of office automation for Pratt & Whitney Administration, a subsidiary of United Technolgies Corp. "Instead of killing the clones, I think they are trying to kill the Quadrams and ASTs of the world."

At the Personal System/2 announcement, IBM officials said it would make the specifications of the bus available to third parties. However, major board makers such as AST Research, Inc. and Quadram Corp. said they will not have products available until this summer.

Yet another minor aggravation is that the PS/2's monitors are not compatible with existing systems. The four new displays, which are compatible with IBM's Color Graphics Adapter and Enhanced Graphics Adapter modes, define text and graphics much more sharply than IBM's current line.

"The pinout is proprietary, which is going to be a pain," said GE's Ehrlich, noting that the new monitors cannot be plugged directly into existing PCs without an adapter.

Despite the nagging problems with the disk drives and monitors, most users and developers said they think the Personal System/2 line will become a force to be reckoned with, if only because of IBM's formidable financial resources and ability to control the major accounts.

As one pragmatist from the MIS world put it, "What is the alternative to buying these machines?"

Supportive factors

Another factor that could bolster the strength of the existing standard is if Phoenix Technologies Ltd. follows through on its preliminary plans to develop an alternative 32-bit bus extension to IBM's Personal Computer AT bus [CW, April 20]. Phoenix claims that major systems and peripherals manufacturers such as AT&T Information Systems, Quadram and Ing. C. Olivetti & Co. are solidly behind the effort.

Other factors that ensure the vitality of the existing standard are the availability of various adapter cards that give existing systems some compatibility with IBM's new Video Graphics Adapter standard, the ability to run the new protected-mode Operating System/2 on existing PC ATs and the superior performance of a few compatible machines. Many MIS managers said they will continue to buy the same number of compatibles for some users because it makes functional and economic sense.

"These new [IBM] machines are not screamers, so a lot of engineers will continue to buy the 12-MHz clones and low-cost 386s," Ehrlich said. "We'll also buy clones for people in cost-sensitive areas of the company."

All of this means that MIS and micro managers will be supporting two different standards well into the next decade. A related problem for MIS managers will be deciding which users should get which applications. Many MIS managers said they would like to get a head start on working out their applications strategies but said they cannot until they see exactly what OS/2 can do and what the functionality of future OS/2 applications will be.

"We can't make any conclusions until we see the [OS/2] software. I wish they hadn't announced the hardware and software so far apart," said Pratt & Whitney's Goldfarb.

No matter who purchases and supports the new systems, IBM has made it clear that it is willing to nurture two architectural standards in its major corporate accounts. IBM will offer a compatibility box with OS/2, which permits existing applications to be used with the new machines as well as on existing PC ATs. Until OS/2 is delivered sometime next year, IBM is offering PC-DOS 3.3 and its enhanced 3270 Workstation Program as an "interim solution" to customers waiting for OS/2. The DOS 3.3/Workstation Program combination allows users' existing software to exploit some of the multitasking features of the new and standard architectures.

Some analysts do not think IBM will push these interim solutions very hard but that the mechanisms are more a psychological reassurance to corporate users worried that their sizable investment in hardware and software will be made obsolete. Some MIS managers, however, think the Workstation Program was the best part of the recent announcements because it eliminates the need to buy any more 3270 Personal Computers and gives them smooth connections up and down IBM's 370-compatible line. •

IBM PC-, XT- and AT-compatible market shares

IBM's share declines

Company	1985 Market Share	1986 Market Share
IBM	57.6%	41.8%
Tandy Corp.	4.4%	9.1%
Compaq Computer Corp.	8.9%	6.6%
Leading Edge Hardware Products, Inc.	1.8%	5.7%
AT&T	7.8%	5.1%
Zenith Data Systems Corp.	4.7%	4.2%
PC's Ltd.	—	3.1%
Kaypro Corp.	—	2.0%
ITT Corp.	2.1%	—
Others	12.7%	23.4%

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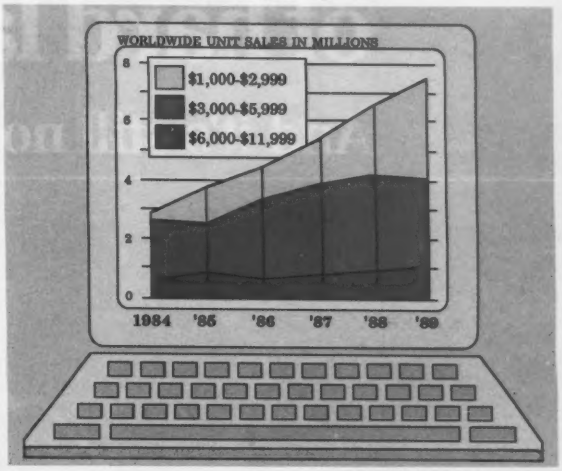
Personal Computer sales

Biggest growth seen for low-end, high-end systems



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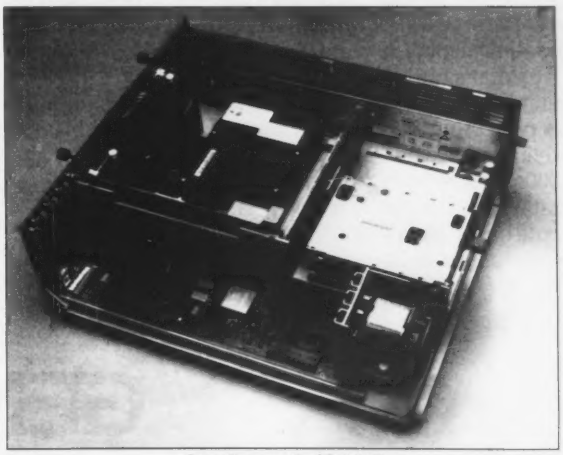

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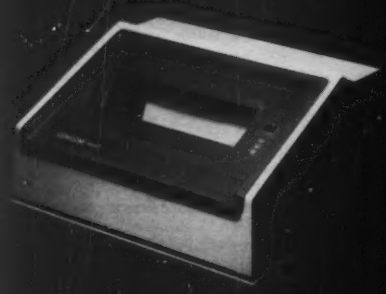

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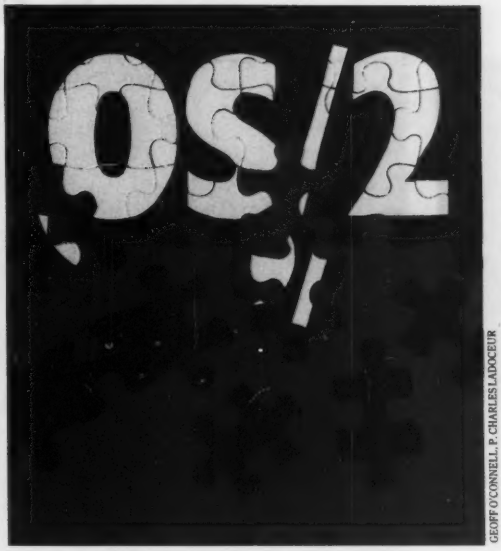
Putting together the pieces of the future operating system



GEOFF O'CONNELL, P. CHARLES LADOCEUR

BY DOUGLAS BARNEY
CW STAFF

MIS professionals wondering whether to embrace Operating System/2 are missing two crucial pieces of information — when specific applications will arrive and what advantages they will provide.

While applications vendors are not disclosing exact details, many new products that promise to take advantage of varying levels of OS/2 functionality are already under way.

For instance, when the OS/2 kernel, or core component, ships to users in the first quarter of 1988, simple ports of many existing applications are also expected to ship.

Not all applications will be easily ported to the new operating system, however. In fact, some may require a total rewrite to take advantage of additional memory, according to Ashton-Tate Chief Scientist Robert Carr. Much of the applications portability depends on the language on which it is based, the use of graphics and the design of the product, developers said.

Ported applications will look much like the current versions but will be able to take advantage of OS/2's ability to multitask with other applications and, in many cases, will address more than 640K bytes of random-access memory (RAM), the limit of IBM's PC-DOS and Microsoft Corp.'s MS-DOS.

The biggest advantage of many ported applications, however, will be additional address space. Entire programs, which are often so large that they consume five or more floppy disks, can be loaded into the memory, and the time-consuming process of swapping program code between the hard disk and memory will be nearly eliminated.

Better still is the large space for data. Spreadsheets can get even larger, and perhaps most importantly, users can sort multimegabyte data bases in memory.

Such applications, however, will run more slowly than their PC-DOS and MS-DOS counterparts, Microsoft says. According to the firm, the protected mode, which provides extra address space, is inherently slower than the real mode, which provides only 640K bytes of RAM.

The second wave of applications, scheduled to appear later in the year, will be built from the ground up to take advantage of OS/2. With an increased focus on graphics, ease of use and multitasking, many of these applications promise to differ substantially from current applications.

Some entirely rebuilt applications will debut soon after the operating system ships early next year. In addition, an OS/2 Developers Toolkit is slated to ship to users this summer to help both users and vendors develop the new generation of applications.

Continued on page SR14

Extended OS/2: Ties that bind

BY CHARLES BABCOCK
CW STAFF

The Extended Edition, Version 1.1, of Operating System/2 offers a range of options for tying desktop computers closer to the data processing center, but IBM must take several steps before its full potential will be realized, industry observers said.

Nor has IBM announced an availability date for the advanced operating system. Availability is scheduled to be revealed in the fourth quarter of this year. Observers both inside and outside IBM believe the company is aiming for the fourth quarter of 1988, but company officials were unsure of being able to meet that schedule at the time of the April 2 Personal System/2 announcements.

Even with a first release at least 20 months away, several parties that anticipate closer ties between micros and host machines are excited by the features listed in the OS/2 Extended Edition.

Features include a communications manager, a relational data base management system, terminal emulation and a data import utility that allows files from IBM's DB2, Structured Query Language/Data System (SQL/DS), ASCII files or even Lotus Development Corp. 1-2-3 files to be imported to OS/2 applications.

IBM's emphasis on the word "system" for Personal System/2 is taken as a sign of its commitment to integrate micros and mainframes seamlessly, Esther Dyson said in her "Release 1.0" newsletter.

Even those who think IBM has a long way to go before making any of its hardware systems seamless took heart from the announcement. "At least IBM has played its hand," said Vaughan Merlyn of Merlyn Consulting in Marietta, Ga.

"The key thing about OS/2 Extended Edition that ties it more closely to the host is the communications manager, which is a full, multitasking, multiprogramming communications manager," said Lee Reiswig, a systems manager for IBM's Entry Systems Division in Montvale, N.J.

The multiple capabilities tied to the processing power of the Intel Corp. 80386 chip will allow developers to provide applications that do part of their work on the host and part on the Personal System/2.

For example, a user entering a health insurance claim data at a Personal System/2 instead of a dumb terminal could have automatic data verification provided on the personal computer and then automatically upload to the mainframe data base. In addition, the user could have the assistance of windows and Help screens that are not possible on a

Continued on page SR15

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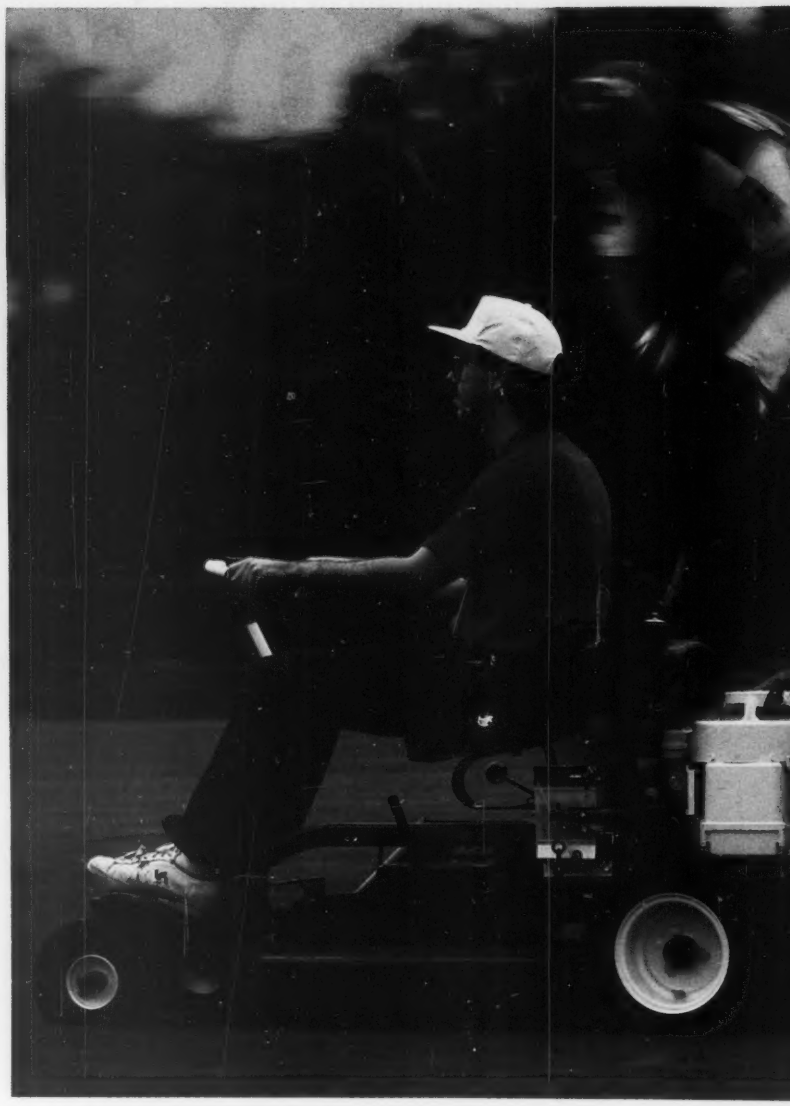

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OS/2 pieces

CONTINUED FROM PAGE 11

One firm that expects to quickly ship an application that takes full advantage of OS/2 is Information Builders, Inc., maker of the PC/Focus data base package. "Barring major changes, we could ship by the end of the year, if the operating system shipped," said David Feldstein, vice-president of micro products for Information Builders.

Besides the large address space, OS/2 offers a multitasking capability, which will allow applications to be constructed in a modular fashion.

"You can have combinations of applications running together that are really separate pieces but that are highly integrated," said Lotus Development Corp. Vice-President of Research and Development Ed Belove.

While most developers intend to exploit OS/2's multitasking and address space, it is unclear how well the Presentation Manager will fare. It is also unclear when Presentation Manager-based applications will arrive, as neither Microsoft nor IBM has announced an availability date for the Presentation Manager.

Largely based on Microsoft Windows, Presentation Manager promises to make applications more consistent, ease user training and provide data exchange between applications, Microsoft claims.

Full use of the Presentation Manager, however, requires widespread support of software developers and a sizable user investment in hardware. Users will need an Intel Corp. 80286- or 80386-based machine, hard disk and at least 1.5M bytes of RAM. A mouse is highly recommended. In addition, users will need more expensive video enhancement boards.

"If you just have an IBM Color Graphics Adapter, you aren't getting the full benefit," Microsoft Chairman Bill Gates said. "You really need an Enhanced Graphics Adapter or something equivalent to the new IBM Video Graphics Array."

For users and developers, moving to the Presentation Manager is not as easy as opening up Microsoft Windows, since it lacks compatibility with the current Windows product. "It is not compatible. That is why we have been investing our energy in the Presentation Manager. That is where we see the future of graphics as going," Lotus's Belove said.

Vendors can also use different strategies for different customers. "You can choose to never go to graphics at all. We will continue to support monochrome displays, and Lotus is also committed to character-based access for a large segment of our customer base," Belove said.

Microsoft, however, claimed most applications will optimize the Presentation Manager. "We probaby won't see many of these applications that take advantage of the additional internal interfaces in OS/2 but don't use the Presentation Manager," said Steve Ballmer, Microsoft's vice-president of systems software. "If you are going to redesign your application, you are probably only going to redesign it once, and you will redesign it using the Presentation Manager."

Ironically, some developers are already thinking of the day when 16M bytes of RAM will be as much of a barrier as 640K bytes are today. While few programs will use 16M-byte RAM for code alone, the influx of multitasking, graphics and larger sets of data in memory may eventually require a shoehorn to fit in 16M bytes.

"It would not surprise me at all that 16M bytes would be a real barrier within the next 24 months," said Lee Reiswig, systems manager for the communications and data management division of IBM's Entry Systems Division. "New applications will exploit graphics, image processing, voice and those sorts of things. Those take up tremendous amounts of storage and memory."

Ashton-Tate's Carr agreed. "You will see programs whose code fills up a megabyte, and users will be running four of those, each keeping a couple of megabytes of data in memory," Carr said.

But unlike current PC-DOS and MS-DOS, there is a way out that does not require another operating system or tricky bank-switching techniques.

Virtual memory assistance

That solution is called virtual memory, and OS/2 provides up to 1G byte of it. Virtual memory is a way to let storage devices act like RAM and provide an escape valve for an abundance of code and data. "The virtual memory will really help because the operating system will handle swapping a lot of the unused code and data back to disk," Carr explained.

According to Microsoft, both OS/2 Standard Edition 1.0 and the edition equipped with the Presentation Manager attempt to tackle the ease-of-use problem. The complexity of the PC-DOS and MS-DOS interface, however, is a recalcitrant beast. While the Presentation Manager will help users navigate through files, exchange data and access program functions, the operating system kernel itself shares much of its look, feel and complexity with the current PC-DOS and MS-DOS operating systems.

In addition, both versions of the operating system have extensive error messages that explain why an error occurred and suggest ways of correcting the problem. But to get the most on-line Help, Microsoft suggests use of the Presentation Manager.

During the year-long wait for OS/2, software vendors will unveil their strategies in bits and pieces and, with any luck, show what OS/2 can do for you. •

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Extended

CONTINUED FROM PAGE SR11

dumb terminal, said Steven F. Kuekes, senior developer at Tangram Systems Corp. in Cary, N.C.

Theoretically, Kuekes said, an application that must rely on a mainframe data base management system could use the capabilities of the Extended Edition to also take advantage of "the things that are good on the PC today."

This is already possible with IBM's Advanced Program-to-Program Communications (APPC) PC product, but Kuekes said few vendors have written programs for it because the application interface must be written in assembler language, and it is "hard to write transaction processing programs for it." In addition, APPC/PC requires 215K bytes of a Personal Computer's 640K-byte memory limit, so there was little memory available for an application once it was composed.

With the release of OS/2 Extended, the same capability will be built into the operating system on a personal computer that has up to 16M bytes of addressable memory available. "You could have multiple transactions on one machine talking to multiple transactions on another," Kuekes predicted.

The Extended Edition of OS/2 will also have a built-in relational DBMS and communications manager that appear to offer a wide range of micro-to-host options. These features may open possibilities one day of distributed data base systems accessible through a common SQL interface, although IBM acknowledged it has work to do there yet.

The relational data base management system is "consistent with IBM's family of relational data base products, DB2, SQL/DS and Query Management Facility," according to IBM. This is one of IBM's first references to a "family" of relational data base products. Extended Edition customers may expect "consistency" with this family to mean something different than what IBM is likely to provide.

For example, files transferred between DB2 and the Extended Edition relational product will have to undergo conversion, but it will be handled automatically in the background by both the host and OS/2, IBM sources said.

The relational system will be given a Query Management Facility (QMF) user interface similar to but not the same as the product on IBM mainframes, IBM's Reiswig said. "Each one has a little bit that the other one would like more of right now," he noted. Although there is consistency of terminology, the OS/2 version will have "more end-user tools and facilities" that IBM hopes to one day merge into the mainframe, Reiswig added.

Merlyn, an end-user interface consultant, predicted that the OS/2 version of the Query-By-Example part of QMF will offer bit-mapped graphics and screens that will help end users to compose SQL queries. Data presentation will be more user friendly in the way of preformatted screens, he predicted.

Moving toward SQL

Although SQL queries can be used against relational data bases on a variety of hardware, they require a network to become functional. Reiswig acknowledged that SQL queries formulated on a micro running Extended Edition would not be able to access data in DB2 on a mainframe due to this gap.

"We are moving in that direction. We have announced a planned enhancement to OS/2 Extended Edition to support remote data base access on our local-area network," but it will require "a fair amount of work" to provide the same access to DB2 and SQL/DS, Reiswig said.

The Extended Edition operating system will also offer terminal emulation for IBM 3270, 3101 or Digital Equipment Corp. VT100 terminals. However, Joseph Farrelly, vice-president of research and development at Applied Data Research, Inc. (ADR), said that capability represented little real gain. The same capability was available on existing PCs through add-on boards, he noted.

IBM's announced intent to provide a common Systems Applications Architecture will theoretically ensure that applications written in programming languages such as Cobol 85, Fortran and C will run on Personal System/2 units as well as mid-range machines and mainframes. It will become much more common to see "application sets," with a part running at one level cooperatively with parts at different hardware sites, Farrelly said.

The extended version of OS/2 will also create much stronger local-area networks (LAN) capable of sharing data among relational data bases, Farrelly predicted. But IBM will still need "a distributed capability over and above what's provided in OS/2 Extended Edition," he noted. "That part still appears to be fuzzy," he said.

ADR is continuing with its plans to offer a development language on IBM PCs, a micro version of its mainframe Ideal system, a relational DBMS and LAN products. IBM's renewed emphasis on personal computer "systems" was hailed at ADR as heading the company in IBM's direction, Farrelly said.

OS/2 Extended Edition will retail for $795, exceeding the $85 retail price of PC-DOS. IBM spokesmen pointed out that Extended Edition incorporates operating system advances along with what used to be several independent products. It is designed to run on Personal System/2 Models 50, 60 and 80 and the Personal Computer AT and PC XT Model 286. •

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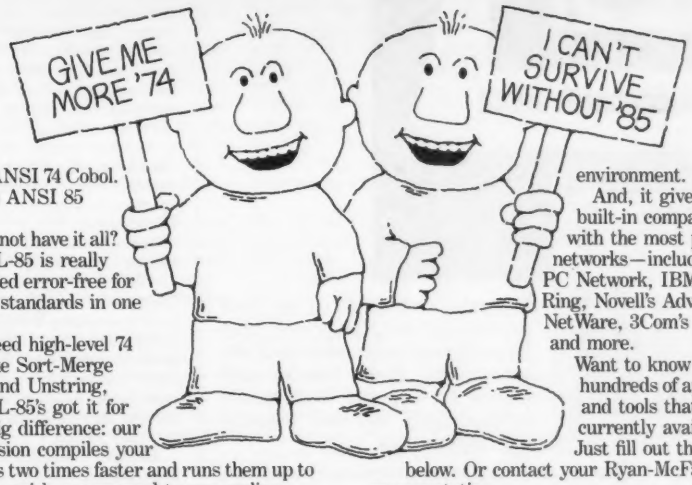

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Expansion board market opens wide

Add-on board makers to support traditional areas of old, new system standards

Developers of IBM Personal Computer and compatible expansion boards say IBM's Personal System/2 line offers new options for expanded features while opening a market for upgrades of the vast installed base of IBM PCs and compatibles.

In the next six months, users can expect to see graphics and video cards that enable existing systems to match more closely the built-in features of the PS/2 line, memory boards that meet the capabilities of the still-forthcoming operating system and add-ons that allow users of the low-end PS/2 Model 30 and Model 50 machines to upgrade them to the capabilities of the Models 60 and 80 at a lower cost.

Because of the vast installed base of IBM PCs and compatibles, most expansion board vendors said they will not neglect development for existing systems. Most expected sales during the next few years to be split almost evenly between old and new hardware as users upgrade existing PCs to match the new, more powerful industry standards.

"IBM just made all those corporate Personal Computer XTs orphans, and I'm pleased," said Joe DeCaro, president of Seattle Telecom & Data, Inc., a Redmond, Wash., developer of accelerator boards based on Intel Corp. 80286 and 80386 chips. "IBM is saying 10-MHz, 80286 machines are minimum. IBM is building my installed base [for upgraded machines]," DeCaro added.

However, developers were less forthcoming about what new products they might build for the PS/2s. The new machines have taken many features that were once the domain of add-on boards and built them onto the unit's system board.

When pressed for specifics, most developers said they would do little that is new with the PS/2s. Rather, they will focus on more traditional areas like improved graphics, communications, memory upgrades and add-on hard disks.

"We expect any new products to be about evenly split among our three main areas — mass storage, communications and [memory] expansion board products," said Nora F. Gildea, director of marketing for board maker Ideassociates, Inc. in Billerica, Mass.

Third parties revving

And third-party developers are revving up to deliver as fast as they can. Ideassociates, Quadram Corp., AST Research, Inc., Sigma Designs, Inc. and Orchid Technology Co. were among those that said PS/2 products are forthcoming by the end of the year. AST promised a new product within 10 weeks, according to Tom Yuen, executive vice-president of strategic planning and new business development.

An AST spokesman said the company will build new PS/2 products from the technology in its existing products, which include memory and speed-up boards, IBM Enhanced Graphics Adapter (EGA)-compatible graphics boards and a family of modems. AST also claimed that the new IBM Micro Channel architecture is similar enough to its Fastslot bus to make conversions easier.

Prime AST rival Quadram — a Norcross, Ga., developer of numerous enhancement boards — has zeroed in on the memory expansion gaps IBM left in the new line. Quadram President Bob Brown noted that IBM offers only a 2M-byte memory board to boost the new systems' random-access memory. Third parties can find a market in offering higher density memory boards, he added. Orchid Technology also already has a 2M-byte memory card with expanded memory specification support in the works for the new systems.

But expansion card vendors said they are also picking their products carefully.

"We will adapt the products that make sense to the new machines," said David Le, vice-president of marketing for Sigma Designs in Fremont, Calif. He expects to develop an extended EGA board that works with both the existing and new systems, as well as adapt existing tape backups and high-resolution displays for use with the PS/2 line.

Hercules Computer Technology, Inc. in Berkeley, Calif., a leading developer of graphics add-on products, will rely heavily on the installed base, according to a company spokesman. While existing PCs are still widespread and less expensive than the new line, and little software yet requires the PS/2 line's features, most customers will stick with what they have and turn to the third-party vendors for enhancements, said Bruce Cummings, Hercules's executive vice-president. Cummings said a lot of Hercules's business will be meeting the growing needs of compatibles vendors that want to offer graphics on their systems now that IBM has added graphics to its latest hardware.

Wayne Erickson, program manager of Plus Development Corp. in Milpitas, Calif., said the "trickle-down effect" that builds the market for add-ons is height-

Continued on page SR18

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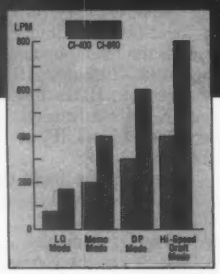

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INTERVIEW

Explaining the new PC

William C. Lowe became the president of IBM's Entry Systems Division (ESD) in 1985, replacing the late Philip "Don" Estridge. The move was viewed as IBM's effort to bring the once entrepreneurial division back in line with the corporation's key goal of delivering business systems that complement and help sell its larger systems. Since that time, IBM has relocated ESD headquarters to within hailing distance of Armonk, N.Y., publicly disdained the cut-rate nature of the low-end personal computer business and, most recently, unveiled PCs that are clearly aimed at tying into IBM's larger systems. *Computerworld* Senior Editor Douglas Barney recently spoke with Lowe to get the views of the man behind the new IBM machines.

How important is OS/2 Extended Edition to MIS customers?
We offered the operating system in two versions — one that just had presentation management and the operating system itself — to allow our customers to utilize other data bases and communications if they want to. We believe that packaging the communications and data base will allow us to provide superior usability to our customers, and our hope is that most of our large-account customers will choose the Extended version.

When will we see OS/2 applications?
We are going to attempt to continue making a flow of information available to independent software vendors on OS/2, so hopefully they will have their applications available as close to concurrently with the operating system shipping as we can get it.

The ability of OS/2 to run existing applications lengthened the development cycle. Was the "compatibility box" worth the wait?
One of the characteristics of IBM's product development is that we go to great lengths to protect our customer's investment. From our perspective, it wasn't an option. It was required.

What are large-account customers asking for in PC enhancements?
The keys are the sharing of resources between the workstation and the intermediate and large processors, the sharing of data, the flexibility to manage data where it makes sense in the information systems environment, providing a consistent communications capability and allowing them eventually to move applications around their DP resource with a consistent end-user interface.

With the Extended version of Operating System/2, we will have a data base capability that is essentially the same as that in the 370 host, we will provide consistent communications, and through the investments in line with Systems Applications Architecture, we will have the applications portability as well.

How can MIS prepare for OS/2?
We are working with our account teams to try to provide guidance to those customers that choose to use PC-DOS now — or the 3270 Workstation Program — so that the choices they make in designing applications for PC-DOS or the workstation program will ease their migration into OS/2.

We will also be selecting some early support customers later this year to help us ensure that the OS/2 does what we and our customers want it to do.

How is the PS/2 line optimized for OS/2?
The previous Personal Computer AT family is valuable, and the [Intel Corp. 80286] XT will also run OS/2, but they have the limitation of the slower processors and the bus structure that does not manage hardware tasks concurrently.

Therefore, I would expect that through time the Micro Channel versions of our new hardware products will run better with OS/2 — that is, we will be able exploit all of the characteristics of the hardware, be able to support higher performance communications and — most importantly — be able to support concurrent tasking procedures.

Are you positioning the PS/2 line as multiuser products?
AIX was announced for the [Intel 80386] products, and it is our intent to support multiuser capabilities eventually on Operating System/2.

Does that mean OS/2 will eventually become a multiuser operating system?
That is our intention.

When might we see that?
I am not going to speculate on the time frame for that.

Does OS/2, with its extra address space, make PCs more useful to MIS?
Clearly, relief to the 640K-byte barrier and the provision of substantially larger storage capability on the processor was required for our large-account customers. I would not say that that requirement was limited to just our large-account customers.

What is the life cycle of the PS/2 line of hardware?
Life cycles of product lines, based on my 25 years of experience, are always longer than you anticipate. I know when I took this job, there was a lot of belief in the industry that there weren't going to be any [Intel] 8086 or 8088 products beyond 1985. Clearly, we just introduced some very powerful 8086-based products in our new family. The focus that we had was to build a platform that would allow us to take advantage of the technology and meet the applications requirements for the next five to 10 years.

What is the life cycle of OS/2?
We are making a major investment in OS/2, and I expect it to be a base for application development for a very long time to come. Clearly, the useful life of the software system will extend beyond the useful life of individual hardware products that are introduced as members of our family.

What does the Micro Channel offer that previous buses have not?
It allows you to manage multiple hardware functions concurrently instead of essentially handling tasks one at a time, as we did with our PC AT architecture.

I think the AT architecture will continue to serve many customers for a long time to come, but it doesn't have the efficiency built onto it that the Micro Channel allows.

Will the new machines help IBM in gaining a market share?
What I am focusing on is providing the best product I can. By having leadership products, I think the customers will buy ours. I am very enthusiastic about the potential for these products.

Is there any legal way to clone the PS/2 line?
I am not going to speculate on that question. We made a significant investment in the new products; we would expect to get a return on the investment and protect what is rightfully ours.

JUDITH DuPOUR LOWE

William C. Lowe

Regarding what other people will do, I just don't know.

When will third-party hardware products be available for the new machines, and did you work with any of these vendors prior to the announcement?
We had very few discussions with third-party hardware providers, but on April 3, the day after our announcement, we held a meeting in Miami to which we invited many of those people to give them the information they will require to complement our products.

Open architecture was one of the key decisions we made when we introduced the first PC. I heard all the discussions in the industry about whether we were going to be compatible, whether we were going to continue to be open or whether we needed to just be different. I think the answer is clear. We revisited that open architecture question and feel as strongly as ever that it is important to keep our products open by providing sufficient

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Explaining

CONTINUED FROM PAGE SR17

information to third parties so they can write applications and complement our products with I/O capability.

Did you have the sense that the industry did not believe you when you keynoted Comdex/Fall '86 and committed to an open architecture strategy?

I got the impression that they didn't believe me. I attempted to be clear purposely, and I think we are clear now with the content of our announcement.

Why are the new machines software compatible but not hardware compatible?

If you look at the graphics capability, the communications capability required for the applications our customers expressed that they want to move to, plus the capacity of the I/O devices, the need for high-performance memory addressing and the performance of the processors that are coming, we needed a better balanced system to manage those resources. We think we have provided that base with the Micro Channel. I don't think there would be any other way to deliver the value of the new technology to our customers.

Are you now supporting two PC standards, the existing PC line and the new PS/2 line, and will you enhance the older XTs and ATs?

As we go through time, we are going to maintain the software and enhance the software that currently runs on those products, as well as ensure that OS/2 runs on those products. We are going to ensure that those products can participate in networks and communications environments with the new systems. But we are going to primarily invest in enhancing the new family.

Are you still producing XTs and ATs?

Yes, we are continuing to build XTs at this time, although I don't expect that we are going to be manufacturing XTs for a long time into the future. We are manufacturing the 286 XTs and AT models.

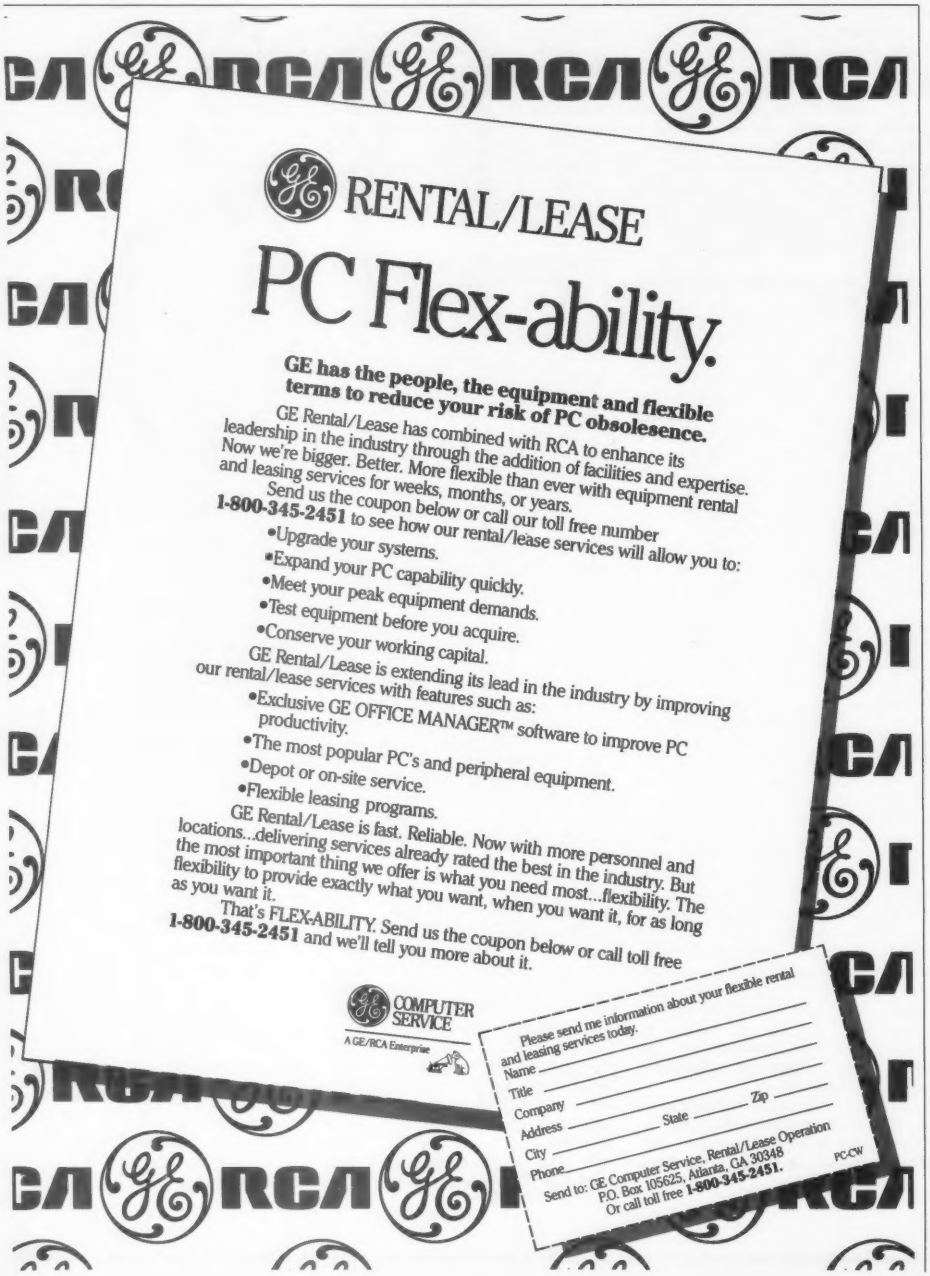
Users can upgrade existing ATs and 286 XTs to new Video Graphics Array (VGA) graphics and 3½-in. floppy drives but cannot upgrade to the new bus?

That is right. You can't upgrade to the new bus. The new Micro Channel is really built-in custom logic on the system board.

Are there technological advantages that the PS/2 line gives to MIS?

If you just look at the top sheet, we are offering higher performance, more direct-access storage device capacity, a better utilization of desk space, a new graphics standard and a level of quality that, from a mean-time-to-failure point of view, is five times better than that of the orginal PC.

Then, if you look underneath the covers, you see the design of the Micro Channel. You have there the base to utilize the new high-performance processor and I/O technology and to run the system concurrently with multiple communications environments, for instance, and to run applications of the future. I believe that the most important aspect of the 286 and 386 machines that we have just introduced is the bus design and the architecture. •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PC-CW

Expansion

CONTINUED FROM PAGE SR16

ened by the new line.

Of IBM's new systems, the low-end Model 30 is the most similar to existing PCs and is the first and easiest target for most add-on developers. But major vendors said their engineering departments are already tearing apart the new, advanced hardware and poring over the technical specifications for the new systems as they arrive from IBM.

IBM is actually being supportive of third-party development, according to Quadram's Brown. "We're being encouraged instead of tolerated," he said. IBM left three expansion slots in the Models 30 and 50 and seven in Models 60 and 80, with all but the Model 30 using the 16-bit Micro Channel bus.

That bus provides the biggest challenge for developing products for the PS/2 line. Technical specifications were not available at the developers meeting in Florida during the announcement, "and [IBM] sort of had a minor riot on their hands" from third-party developers, Ideassociates' Gildea said. IBM promises delivery of the full specifications in May.

"Something becomes a standard once multiple companies are developing for it," said Bill Roland, president of Renaissance GRX, a Bellevue, Wash., graphics and accelerator board developer. "Until then, the Micro Channel is not a standard, even if it's IBM's." Roland said Renaissance will develop versions of its high-end graphics boards that will work in the new IBM hardware.

Add-on developers may usurp IBM in some markets, according to Gildea. "I think third-party manufacturers are in as good a position as in the past to beat IBM to market and offer higher functionality at a lower price." She said she doubted the Models 50 and 60 will proliferate until board products support them.

"They have a lot of sizzle but not much steak in what they can deliver right now," she added. •

A light dawns over IBM's connectivity strategy

BY PATRICIA KEEFE
CW STAFF

The hordes of MIS directors trying to hack their way through the knotted tangle of certified and would-be connectivity standards just found a little daylight. Until now, the burning question for MIS has been, Which path do I take? Whether the issue was cabling, servers or software, users were often completely befuddled.

A source for much of this confusion was IBM, which has bombarded users with a series of incompatible networks and miles of confusing acronyms, all the while mired in the 12-year evolution of Systems Network Architecture (SNA).

But with one fell swoop, on April 2, IBM announced its new generation of personal computers and microcomputer operating systems, and suddenly, IBM's connectivity strategy became clear.

And, while many users expressed disappointment with IBM's enhancements to its PC Network and Token-Ring networks, IBM's vote of confidence for Netbios, provisions for network management tools and reaffirmation of 3270 connectivity gave users a reason to cheer.

Big Blue road map

IBM's announcement effectively issued a communications road map revealing the Token-Ring as the highway and Operating System/2 as the vehicle by which users will crisscross incompatible IBM systems under a Common User Interface to be provided within IBM's Systems Application Architecture (SAA).

The game plan is to support advanced network functionality — such as Advanced Program-to-Program Communications, LU6.2 and Enhanced Communications Facilities — in order to more tightly integrate IBM's diverse environment from top to bottom by the early '90s.

The message to MIS is clear, analysts said. Users should line up behind the Token-Ring network and communications-rich proprietary OS/2 Extended Edition or risk missing the boat.

"This announcement is intended to be a directional announcement for the large corporate MIS purchaser ... who wants control and corporatewide standards like [SAA] and who needs years to orchestrate [his] plans," said John B. Jones Jr., an analyst with Montgomery Securities in San Francisco.

Much to the impatience of IBM shops looking to solve connectivity problems today, IBM's plans for the future are, in fact, future. Many of the products announced last month are six to nine months away, with initial SAA applications anticipated several years down the road.

Of more immediate impact is IBM's announcement of 25 or so communications products along with the Personal System/2s (see story page SR20). The new products include enhancements to IBM's current network offerings, the Token-Ring and the PC Network, including the availability of the latter in either broadband or baseband.

Missing from the April 2 onslaught was the anticipated 16M-bit Token-Ring card, built-in Token-Ring connectivity, a dedicated file server and an OEM agreement with network software vendor Novell, Inc.

Sources say IBM will not release the 16M-bit Token-Ring card until it believes there is sufficient demand. The Token-Ring on a chip is still too tricky and too expensive and will not be available for some time, industry analysts said. Instead of a dedicated file server, IBM has said that the high end of its PS/2 line can serve that purpose. And while there may not have been any OEM agreement, sources said IBM did provide Novell with advance information and that the relationship between the two companies is strong.

IBM addressed management and interface issues. It derailed skeptics who predicted it would abandon the Netbios interface for LU6.2. Instead, IBM announced Token-Ring support for Netbios, which has become a standard for the development of micro network applications and has strong support in the user and developer communities.

IBM also outlined a three-pronged networking strategy: the new baseband PC Network for the education market, the older broadband PC Network for work group or departmental systems and the Token-Ring as backbone. Support for larger systems on the Token-Ring is slated for delivery between June and September, sources said, including support for the System/36 (see chart at left).

IBM also responded to a raft of criticism concerning its network management. The announcements addressed two problem areas: moving network management down to the PC

Continued on page SR20

IBM LAN positioning

A comparison of IBM LAN solutions by connection, attachment and cabling

	IBM Token-Ring network	IBM PC Network (broadband)	IBM PC Network (baseband)
Application Interface	←	Netbios	→
	←	APPC/PC	→
	←	IEEE 802.2	→
	←	LLC	→
Devices that Attach Directly to Network	←	PC and PS/2	→
	9370 3725 Model 20 3174 System/36		
Number of Nodes per Network	260 per ring unlimited	72 with kits 1,000 per custom	8 per daisy cha 80 per extende
Access Protocol	Token-Ring	CSMA/CD	CSMA/CD
Data Rate	4M bit/sec.	2M bit/sec.	2M bit/sec.
Transport	Baseband	Broadband	Baseband
Host and Network Connectivity:			
IBM TRN Bridge Program V1.1	Yes	No	No
IBM Network Interconnect	Yes	Yes	No
IBM 3270-PC Emulation V3.0	Yes	Yes	Yes
IBM 3270-PC Emulation V1.2	Yes	Yes	No
IBM 3270-PC W/S V1.0/1.1	Yes	Yes	No
Network Management:			
IBM 3270-PC Emulation LAN Management Program V1.0	Yes	Yes	Yes
IBM LAN Manager Program V1.0	Yes	Yes	No
Netview/PC	Yes	Yes	No
IBM PC Network Analysis Program	No	Yes	No

INFORMATION PROVIDED BY IBM

Light dawns

CONTINUED FROM PAGE SR19

Network and allowing users to manage a group of networks, local or remote.

Of greater concern to many corporations is their base of older IBM Personal Computers, compatibles and clones.

Users will be relieved to know they can mix the older IBM PC line and PC Network Sytek, Inc. cards with the Token-Ring, PS/2s and adapter cards, said Charles Hanes, manager of technical consulting for Lanquest Group, a consultanting firm based in Santa Clara, Calif.

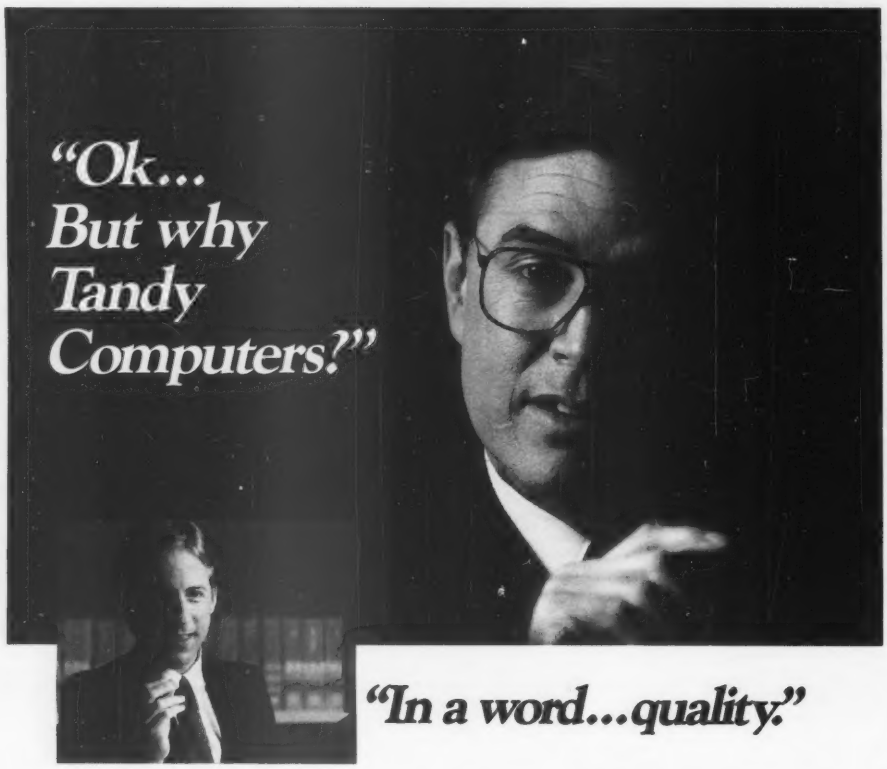
The jury is still out on how the PC clones will fit into IBM networks running under OS/2. Communications applications are less tolerant of incompatibilities than most other software.

A bigger unknown is the extent to which third-party — non-IBM — networks will be able to talk to IBM networks and PS/2s. Almost all the major independent local-area network (LAN) vendors have indicated they will revamp their network adapter cards to fit the new PS/2s [CW, April 20]. The network operating system vendors are split on whether they will emulate OS/2 and Microsoft Corp.'s LAN Manager, an enhanced version of Microsoft Networks — MS-Nets — or license both products from Microsoft.

Network vendors 3Com Corp. and Novell have said they will be ready when OS/2 ships. Novell's ability to garner advanced information from IBM allowed it to announce, ahead of its competitors, immediate workstation support for the PS/2 Models 30, 50 and 60. But Novell emulates PC-DOS and MS-DOS, and competitors have suggested it faces more code changes to keep up with OS/2 than do those networks that run on top of DOS.

If IBM and Microsoft diverge, as expected, on OS/2 Extended, then these LAN makers and their competitors will have to decide whether to support both standards or just one. "It's a real question whether [those who emulate DOS] will be able to run the new applications designed for the protected mode of OS/2," said Timothy Sutton, president of Torus Systems, Inc. in Redwood City, Calif.

As users and third-party vendors attempt to sort out the short-term impact of IBM's announcement, analysts stress that both groups should not lose sight of the long-range picture. IBM is clearly moving PCs into the SNA environment. Corporations that decide today to hitch a ride with a non-IBM connectivity or systems solution had better be prepared tomorrow to play expensive catch-up or be shut out of the IBM communications strategy. •



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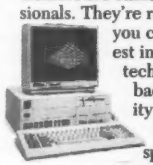
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Connecting cousins

Below are listed some connectivity-related products announced April 2:

Baseband PC Network — A 2M-bit daisy-chained or star-configured network compatible with current IBM Personal Computers and Personal System/2 machines. Operates over all media supported under IBM's Cabling System, including standard telephone wire.

Token Ring Network Starter Kit/A — Includes access unit and four adapters, cable sets and software diskettes and documentation to set up a small pilot network for testing or demonstration purposes. Works with PC-DOS 3.3 and PS/2s.

Enhanced PC Network Program Version 1.2 — IBM claims performance improvements up to 4.8 times. Provides file, print and message functions on a local-area network (LAN). Enables users to share program applications and data bases across the network.

3270 Workstation Program Versions 1.0 and 1.1 — Supports the IBM 3270 Connection adapter card, providing four concurrent hosts, six PC-DOS and two notebook sessions, on an IBM Token-Ring or PC Network. Version 1.1 offers extended Token-Ring network support.

IBM LAN Manager Version 1.0 — Works with the Token-Ring network or the PC Network. It has problem determination and recovery capabilities, can be run standalone or with IBM Netview/PC and can manage multiple Token-Rings.

Microsoft Corp.'s LAN Manager — Provides file and print sharing, security and network management tools. It will support Operating System/2 and Microsoft's Xenix and MS-DOS on the same network. It is an enhanced version of Microsoft's Networks.

LAN Support Program — Provides Netbios and IEEE 802.2 Logical Link Control interfaces across all IBM networks and supports Advanced Program-to-Program Communications for the Personal Computer. PC-DOS 3.3 is required. It also reduces Netbios memory storage requirements.

IBM LAN Asynchronous Connection Server Program — Allows IBM PCs and PS/2s to run on an IBM LAN to access asynchronous host computers, including IBM's RT PC.

PATRICIA KEEFE

Model 50's performance gets only passing grades

Good things — like speed and expandability — don't always come in smaller packages

BY WILLIAM F. ZACHMANN
SPECIAL TO CW

The most striking thing about the IBM Personal System/2 Model 50 — once you take it out of the box, set it up and start to use it — is how ordinary it seems. To be sure, it is smaller, uses 3½-in. diskettes, has its power switch on the front where it belongs and has nifty graphics. Still, it really does not come across as all that much different — in practice — from IBM's earlier Personal Computer, PC XT and PC AT models.

When you pop the cover off, of course, it is readily apparent that the thing is built very differently. A completely new bus structure, disk mounts and internal layout looks loaded with potentially copyrightable and patentable snares for competitors.

Yet the only really noticeable functional difference between the PS/2 Model 50 and earlier systems is in the improved IBM Video Graphics Array (VGA) graphics. Even this, however, is evident only when running software — of which there is precious little available at the moment — that can take advantage of it.

Basically, the system looks, feels and behaves pretty much like a somewhat faster AT in a smaller box. The keyboard is the familiar 12-function-key-across-the-top "new-style" PC AT keyboard. The Color Display 8512 analog monitor does not look much different from any IBM Enhanced Graphics Adapter (EGA) monitor in conventional applications.

The packaging of the system is very nice. To remove the cover, you simply undo two large thumb screws on the back and lift it off. The whole thing is set up so that no tools are required for adding or removing parts, which is a big improvement.

The biggest surprise on the PS/2 Model 50, however, is its performance. IBM's "So, it's power you want?" ads and related publicity certainly seem intended to give the impression that IBM's more proprietary internal design delivers substantially better performance than comparable systems.

In fact, the performance of the Model 50 is about what you would expect from any AT compatible using a 10-MHz Intel Corp. 80286 microprocessor for computational-intensive tasks. An AT-compatible Wyse Technology, Inc. PC 286 — also with a 10-MHz 80286 — and the Model 50 ran a dead heat on a series of comparison tasks (see story page SR23). This means that the Model 50 is actually slower than AT compatibles using faster versions of the 80286. Compaq Computer Corp.'s Portable III or PC's Limited's 286-12 and 286-16, for example, will run circles around the Model 50.

Uninspiring as the computational performance of the system is, the 20M-byte hard drive is even worse, despite IBM's performance claims about its Micro Channel architecture and disk caching. The reason for this, although you have to read the fine print to find it, is that the access time on the disk is an astonishingly slow 80 msec, barely faster than the hard disk on a PC XT. The 30M- and 40M-byte disks on the PC's Limited 286-12 and 286-16, for example, have 28-msec average access times — nearly three times the speed of IBM's 20M-byte hard disk. Admittedly, caching and apparently faster data transfer rates help make up for the slow disks. Sequential program and file loads and file saves perform reasonably well on the Model 50, although not as well as they would with an inherently faster disk.

Where the slow 80-msec access time of the 20M-byte disk on the Model 50 could make itself felt is in running applications like data base programs that require substantial amounts of random disk access. It is difficult to tell whether caching and interleaving improvements will counteract the hard disk's access time problems in most applications. But the question remains: Why did IBM choose such a sluggish disk in the first place?

Not only is the hard disk slow and limited by only a 20M-byte capacity, but it appears to be all the hard disk you can get for a Model 50. There is no space in the chassis for another disk, and the 94W power supply seems to be designed to support no more than the minimal configuration with its three expansion slots.

IBM's new 44M-byte disks with 40-msec access time and 70M-byte, 30-msec drives are conspicuously absent from the list of supported peripherals for the Model 50. IBM says that those disks are intended to expand the base function only of the PS/2 Models 60 and 80. IBM's announcements give no hint of any intention to ever offer more than the slow, 20M-byte drive currently available for the Model 50.

With standard EGA software, the VGA controller and monitor looks no different from earlier systems. In fact, my NEC Corp. APC IV with a Video-7 EGA board provides 640- by 480-pixel graphics on the NEC Multisynch monitor that look every bit as good as — if not better than — the PS/2's extended 640- by 480-pixel VGA mode.

The PS/2's VGA graphics, of course, offer wider color selection, an additional high-resolution text mode and greater speed. VGA graphics will open the door to new applications opportunities. But by the time software is widely available to support it, VGA graphics adapters will almost certainly be available from third-party vendors on any standard IBM PC, XT, AT or compatible system as well.

To get a realistic perspective on the Model 50, I must look at it in the context of IBM's PS/2 line as a whole. The low-end Model

Continued on page SR22

The IBM Personal System/2 Model 50

Zachmann is vice-president of research at International Data Corp.

Model 50

CONTINUED FROM PAGE SR21

30 is not very aggressively priced. However, its much touted 2½-times performance improvement over the XT is used to give the — incorrect — impression that IBM has achieved similar performance gains with the other models.

In fact, the Model 30 is little more than a system-level version of the Microsoft Corp. Mach 10 accelerator board for the XT and achieves almost exactly the same performance. Like the Mach 10, the Model 30 uses an 8-MHz Intel 8086 chip and a memory cache to improve performance over a standard PC XT Intel 8088-based system.

On the other hand, the Model 50 is a crippled machine compared with the Model 60 — with its 207W power supply, seven expansion slots and faster 44M- and 70M-byte hard disks, the performance of the Model 60 is not likely to be much better than 10-MHz AT compatibles with comparable disks, but it ought to be noticeably faster than the Model 50 with its slow disk — all of which leads me to conclude that the Model 50 is basically a bait-and-switch machine.

THE Model 50 is a deliberately handicapped product intended to make IBM's PS/2 line look more aggressively priced than it really is.

The Model 50 looks superficially like the most aggressively priced machine in the PS/2 line. But the slow hard disk, limit of three expansion slots, puny power supply and lack of hard-disk expansion options basically add up to another "defeatured" PCjr-type product. Even cheap XT compatibles offer more and faster hard-disk capacity.

The $3,595 Model 50 is a deliberately handicapped product intended to make IBM's PS/2 line look more aggressively priced, compared with the competition, than it really is. It is the Model 60, at a whopping $5,295 with a 41M-byte hard disk and $6,295 with 71M-byte disk, that is most likely to compare with fast 10-, 12- or 16-MHz Intel 80286-based AT compatibles.

The IBM PS/2 Model 50 will have some appeal for those who are willing to accept its limitations. I would rather spend an equivalent amount of my money on a fast AT-compatible system with a faster, higher capacity hard disk and lots of expansion slots. It will be easy enough to add a VGA graphics adapter later, once software is available to support it. •

Evolution of the PC

IBM's Personal Computer offerings

Computer	Introduction Date	Original Price
IBM PC, 8088 processor 64K-bytes memory, 180K-byte diskette drive monochrome display	August 1981	$3,005
IBM PC XT, 8088 processor 128K-bytes memory, 360K-byte diskette drive, 10M-byte hard disk	March 1983	$4,995
IBM PC AT, 80286 processor 512K-bytes memory, 1.2M-byte diskette drive, 20M-byte hard disk	August 1984	$5,795
IBM Personal System/2, Model 50 80286 processor, 1M-byte memory, 1.44M-byte diskette drive 20M-byte hard disk	April 1987	$3,595
IBM Personal System/2, Model 80 80386 processor 1M-byte memory, 1.44M-byte diskette drive, 44M-byte hard disk	April 1987	$6,995

CW CHART

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PS/2 Model 50 benchmarks

	TIME IN SECONDS			
	Norton Utilities SI Rating	Borland Geobase Compile	Borland Geobase Load	Towers of Hanoi
Tava PC	1.5	46	23	17.7
IBM PC with Microsoft Mach 10	2.5	38.4	20.7	14.5
NEC APC IV (6 MHz)	5.7	22.7	12.8	9.7
NEC APC IV (8 MHz)	7.7	16.4	9.5	7.2
Wyse PC 286 (10 MHz)	10.3	14.1	7.6	5.7
IBM PS/2 Model 50	10.3	13.4	8.1	5.9

CW CHART

Model 50 not quite up to speed

Despite the glitz, unit is no faster than many existing PCs

To get a quick measure of the performance of the IBM Personal System/2 Model 50, I compared it with the systems I use regularly.

These systems include a low-cost IBM Personal Computer XT-compatible system from Tava Systems, Inc., a NEC Corp. APC IV, a Wyse Technology, Inc. PC 286 and an IBM Personal Computer with a Microsoft Corp. Mach 10 accelerator board and a Plus Development Corp. Hardcard 20M-byte hard disk.

I tested the APC IV both at 6 MHz and at its faster 8-MHz speed. I also tested the Wyse system at the 6-MHz speed and at its native 10 MHz. The IBM PC was tested with the Mach 10 at its slower XT-compatible speed as well as at the faster 8-MHz rate for its Intel Corp. 8086 microprocessor.

The programs I used included Peter Norton Computing, Inc.'s Norton Utilities SI program, which estimates the speed of a system relative to a standard IBM PC or PC XT, and Borland International, Inc.'s Turbo Prolog to obtain measures of pure compute and compute plus disk access performance.

Towers of Hanoi test

I measured each system's elapsed time to compile and run the Towers of Hanoi sample Turbo Prolog application, compile the Geobase sample application and load the Geobase data base from disk. The first two of these tasks are primarily computational. The third includes a substantial element of hard-disk access.

THE bottom line is that the IBM PS/2 Model 50 is no faster than you would expect any 10-MHz Intel 80286-based system to be.

The overall performance of the IBM PS/2 Model 50 (see chart above) is insignificantly different from what you might expect of a 10-MHz Intel 80286-based system. The PS/2's performance is essentially equivalent to that of the Wyse PC 286 running at 10 MHz.

Relative to the PS/2 Model 50, the highest performance of the other systems — in nearly every case — comes with the task with the greatest amount of disk access. This reflects the relatively slow 80-msec access time of the 20M-byte disk on the Model 50.

The bottom line is that the IBM PS/2 Model 50 is no faster than you would expect any 10-MHz Intel 80286-based system to be.

The PS/2's slow hard disk actually makes it slower than a 10-MHz AT-compatible, which is normally equipped with hard disks that are much faster and possess higher capacity. •

WILLIAM ZACHMANN

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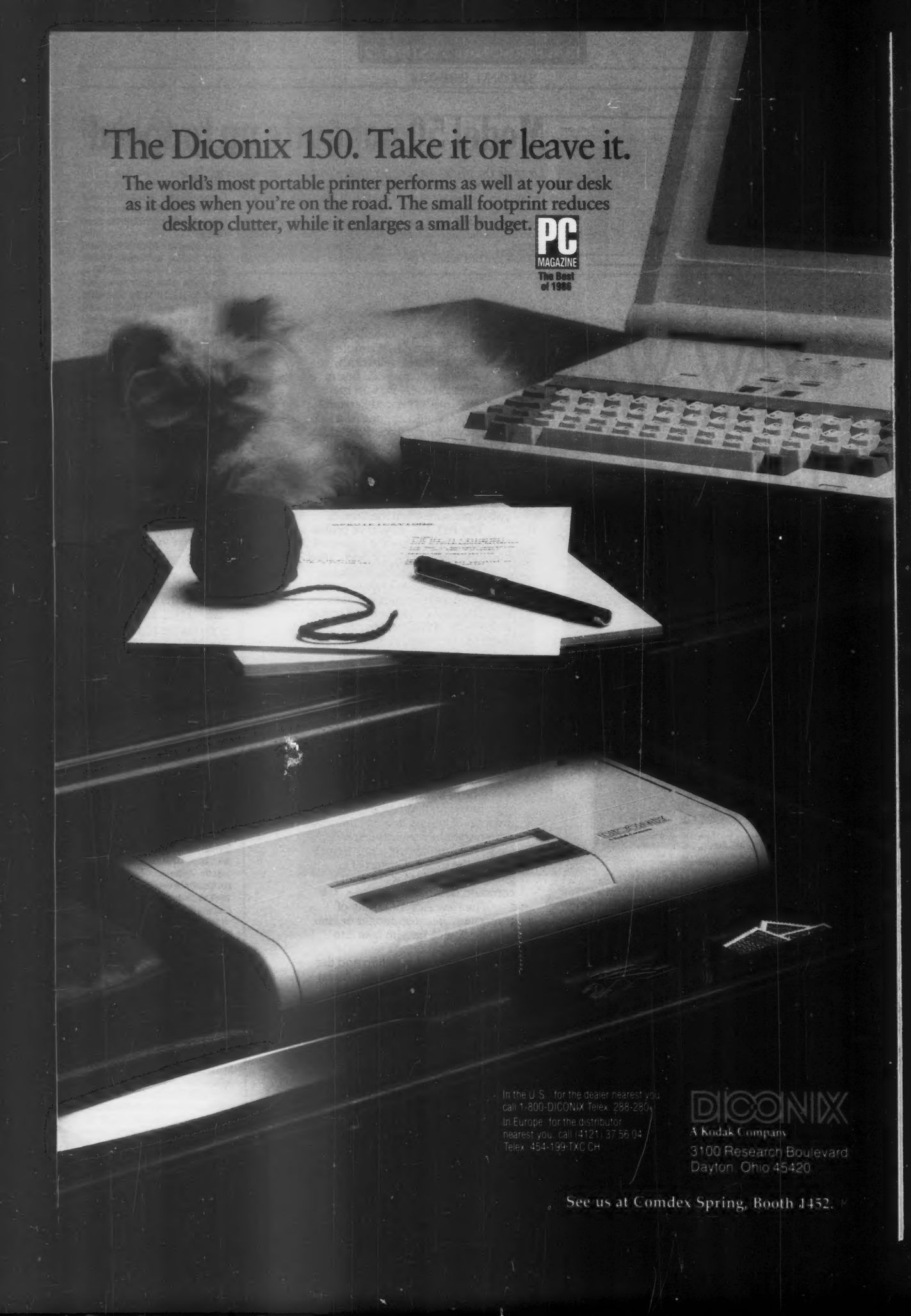
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HARD TALK

James Connolly

Will success spoil DEC?

The adage about success breeding success applies only if the successful learn from that early success. The theory might be applicable to Digital Equipment Corp., which for the past year or so has been the epitome of success in the computer industry.

Despite its success, DEC found itself hearing warnings a few weeks ago when International Data Corp., a Framingham, Mass.-based market research firm, sponsored a conference on DEC. One key theme of IDC's analyst presentations was that DEC cannot afford to lose touch with its customers.

What DEC must be wary of is turning too much of its attention to supporting its growth — hiring employees, building new facilities or marketing its existing products — thus losing track of what its customers will need five years from now or what its competitors are doing. That competition will be coming from various directions, according to IDC, including IBM — DEC's

Continued on page 56

Building a faster computer

Chopp speeds development by simulating machine with CAD/CAE tools

BY ALAN J. RYAN
CW STAFF

LA JOLLA, Calif. — Building a faster supercomputer might be compared with building a better mousetrap. It is a concept that skeptics demand to see in action before they will believe it.

Herbert Sullivan, president and director of Chopp Computer Corp., is building a supercomputer that he claims will be at least 10 times faster than competitive products. The key to his Chopp computer, he says, is its parallel processing ability.

Sullivan says the computer — the core technology of which will be demonstrated at the International Conference on Supercomputing in Santa Clara, Calif., this week — employs two innovative architectural mechanisms to enable high performance in a general-purpose environment.

Within a processing node, nine functional units can be issued and can complete nine instructions every 60 nsec to provide high sequential speed. Also, multiple processing nodes share a common conflict-free memory and employ fast task-switching hardware to provide high parallel task speed.

"With these two complementary mechanisms, both the sequential and parallel code within a program achieve high performance," Sullivan claims.

Sullivan says he has been interested in creating a faster computer for years, and it will soon become a reality.

"We are meeting a very aggressive schedule in terms of designing and putting a supercomputer together," Sullivan says. "Normally, it would take 1½ to two times as long. When we started, we already had under our belt about seven or eight years of conceptualization."

To speed development of the product, Chopp adopted a technique that consists of simulation of the entire machine using computer-aided engineering and design tools.

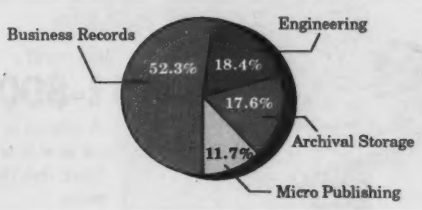
Using software supplied by Valid Logic Systems, Inc. in San Jose, Calif., and run on a Digital Equipment Corp. VAX 8650 and a Microvax II, the engineer inserts schematics into a DEC system that contains a library of the electrical characteristics of each of the 75 to 100 types of chips used in the supercomputer. The supercomputer will include

Continued on page 57

Data View

Info management

Maintaining business records dominates information and image management industry revenue



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CW CHART

Lee clones IBM 3270s

BY JAMES CONNOLLY
CW STAFF

MINNEAPOLIS — Emphasizing the ability to "mix and match" devices, Lee Data Corp. has announced a group of IBM 3270-compatible display terminals and controllers.

The firm said the Lee Data system-compatible controllers were designed to support IBM and Lee Data terminals.

Continued on page 55

Pyramid builds on RISC line

BY JAMES CONNOLLY
CW STAFF

MOUNTAIN VIEW, Calif. — Pyramid Technology Corp. is prepared to extend its reduced instruction set computing (RISC)-based systems product line at the high end and at the entry level today.

Pyramid, which claims an installed base of 650 Unix systems, is scheduled to announce two multiprocessor versions of its Series 9000 computers — the three-processor 9830 and the four-CPU 9840 — and an entry-level uniprocessor called the 9810.

In conjunction with the announcements, the company said it is re-emphasizing its commitment to the commercial market as the firm seeks to distance itself from multiprocessor vendors that focus on the high-performance scientific and engineering markets. Pyramid Chief Executive Officer Richard

Continued on page 56

Inside

- Small business will spend $20 billion on office automation in 1991. Page 55.
- TI releases Multifile for Travelmate 1200. Page 58.
- Dataproducts announces printer stand for 8000 series printers. Page 58.

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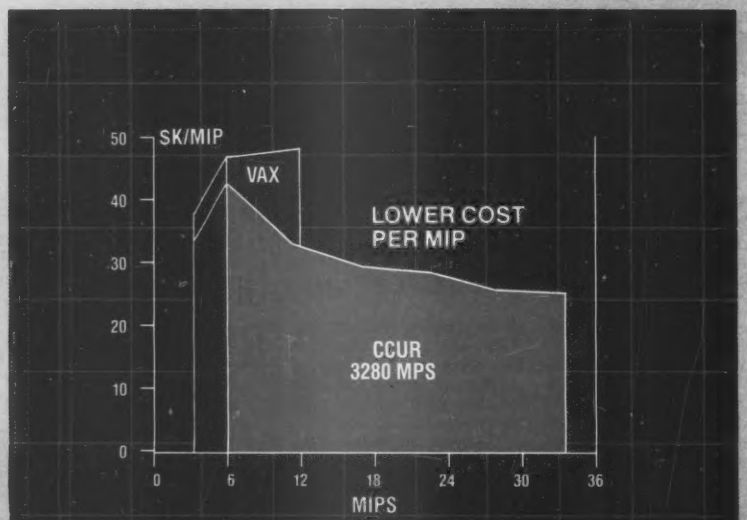

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Small businesses to spend $20B on OA in '91

BY STANLEY GIBSON
CW STAFF

MARSHFIELD, Mass. — Relying heavily on personal computers, small businesses will make $20 billion worth of office automation purchases in 1991, according to a study recently published by CAP International, Inc.

Employing more than 40 million people — or 51.2% of the U.S. work force — small businesses bought $13.1 billion worth of office automation equipment in 1986, a total that is predicted to grow 10% annually through 1991, according to the study.

In compiling the report, the Marshfield, Mass.-based research firm surveyed more than 1,000 small businesses with between five and 100 employees. In addition to computers, the study included telephone systems, typewriters and copiers.

'Making 1.5 million decisions'

"Over the next 12 months, small businesses will be making 1.5 million purchase decisions regarding office automation equipment," said Raymond L. Boggs, director of CAP's small business datatrack service.

Overwhelmingly, the avenue for small businesses' computer purchases will be computer retail stores, and the vast majority of those purchases will be PCs, Boggs predicted.

Half of all businesses with five to 50 employees have PCs and two-thirds of businesses with 50 to 100 employees have the machines, according to the study. In addition, one-quarter of all businesses with 50 to 99 employees plan to purchase PCs within the next 12 months, the survey reported.

'A general conservatism'

"They want to look at technology that has been proven successful. There is a general conservatism," Boggs said. In shopping for equipment, small businesses are looking for established technology, ease of use, reliability and immediate availability, he explained.

"The small business doesn't have a lot of money budgeted for equipment. This money has to be invested prudently to get the best return," Boggs continued, stressing the fact that cost is also a major concern.

Established technology and low price have been two factors that have encouraged small business buyers to purchase PC clones. "The rise of the PC clone market has been driven in large part by small businesses," said Casey Dworkin, a senior consultant with CAP.

Boggs said he found that small companies spend money where it does the most good, but those firms may neglect some areas of office automation completely. For example, a law firm may have an excellent word processing system and a poor telephone system.

Overall, the survey found that most small businesses have invested in their phone systems.

According to the survey, two-thirds of the respondents indicated they owned a key system or a small private branch exchange.

And while PCs are ubiquitous, local-area networks (LAN) are scarce, according to the report. Fewer than 5% of small businesses use LANs and only 1.8% plan to acquire a LAN, according to the survey.

Lee clones

CONTINUED FROM PAGE 53

Lee Data's Model 1191 terminal is an entry-level display terminal designed to be compatible with the IBM Model 3191 but has the advantage of a 14-in. screen rather than IBM's 12-in. screen.

The Lee Data Model 1192 is what the company calls its All-In-One terminal and is available in monochrome or eight-color versions. The All-In-One feature reportedly enables a user to select any of four screen formats, including a wide-screen format for program listing and a long-screen format to display more rows. The Model 1192 is compatible with IBM's Model 3192.

Controller products announced include a plug-compatible option board for Lee Data's 300 and 400 system-compatible controllers with support for Lee Data and IBM displays.

Family of controllers

Lee Data also announced a family of plug-compatible controllers called the Series 300C. They support up to 32 3270-type terminals or printers.

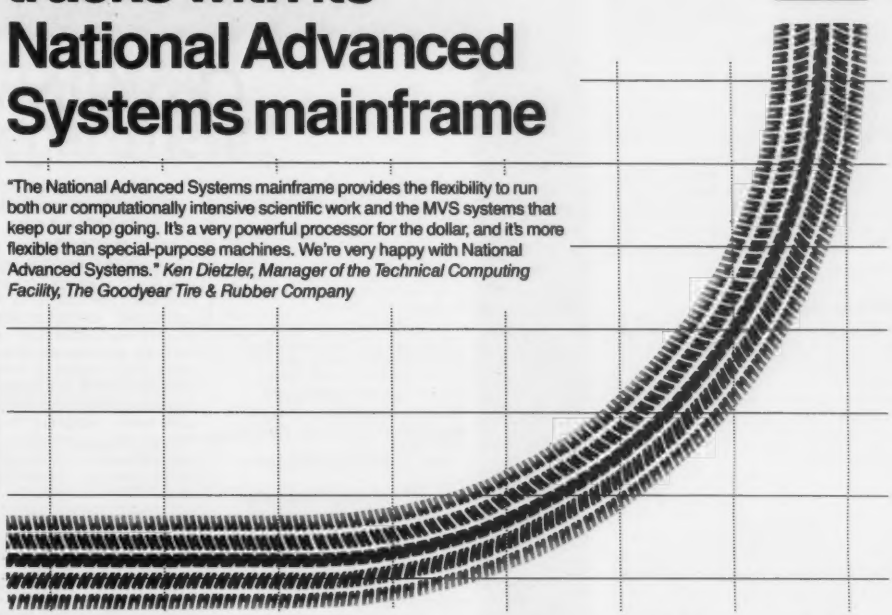
The 300C controller, the plug-compatible controller option board and the Model 1191 terminal are available for immediate delivery. The Model 1192 will be available in July, Lee Data said.

The Model 1191 costs $1,235. The Model 1192C color terminal costs $1,895. The Model 1192D monochrome terminal costs $1,795.

The controller option boards are priced from $1,000 to $1,750, depending on the model of controller. Prices for the 300C series controllers range from $5,900 for the remote, single-host Model 310C to $12,120 for the local/remote, dual-host Model 321C.

National Advanced Systems

Goodyear makes tracks with its National Advanced Systems mainframe



"The National Advanced Systems mainframe provides the flexibility to run both our computationally intensive scientific work and the MVS systems that keep our shop going. It's a very powerful processor for the dollar, and it's more flexible than special-purpose machines. We're very happy with National Advanced Systems." *Ken Dietzler, Manager of the Technical Computing Facility, The Goodyear Tire & Rubber Company*

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DEC success

CONTINUED FROM PAGE 53

traditional rival in the minicomputer industry — and new technologies such as parallel processing.

"We see a real major thrust into the medium-scale segment of the market," IDC analyst Bob Randolph said of DEC's traditional rivals like Hewlett-Packard Co. and Unisys Corp.

Randolph also said the companies that are banking on parallel processing "will give DEC a run for its money." He noted that those vendors are focusing on the market where DEC has long held its strongest position, the high-performance engineering and scientific fields.

IDC officials also pointed to simultaneous threats to DEC from IBM- and Unix-based systems. IDC Vice-President David Moschella noted that DEC's success has been an anomaly, since the firm has prospered at a time when other companies have run into trouble with proprietary architectures. "Almost everyone who has done well in general-purpose systems lately has used industry standards," said Moschella, who expects DEC's minicomputer rivals to rely more and more on standards such as Unix.

Looming over DEC

Moschella added that IBM's 9370 minicomputer represents a threat to DEC and that even if the 9370 fails, IBM could hurt DEC by endorsing Unix as a mid-range solution. Moschella said DEC's supporters should be careful in writing off the 9370 as a competitor.

The system is only the first version, and its failings could be cured the way DEC addressed criticism of its original Microvax — with the release of the Microvax II.

So, what can DEC do in the long term? Randolph noted that DEC has to recognize that it, like IBM today, may someday be locked into a $30 billion software base when it comes time to change architectures. He said DEC already has recognized the value of customized service to the user, which recently helped DEC win a contract in a bid against IBM.

Learning from mistakes

Moschella also noted that DEC has to avoid some of the stances that hurt it in the past. He pointed to DEC's ridicule of personal computers as "toys," which hurt DEC in the desktop market where it needs a much stronger presence, and more recent DEC criticism of manufacturing automation control standards.

DEC must be careful to stay close to its current customers while building on that base. It must make the most of its technology — its common architecture, its strength in the mid-range and its networking — while accepting new technologies. DEC must also recognize that it is not the first company to claim gains at IBM's expense and to position itself as a "giant slayer."

Several companies have done so in the past — companies that have been taken down a notch themselves when they outran their supply lines.

Connolly is *Computerworld*'s senior editor, systems & peripherals.

Pyramid builds

CONTINUED FROM PAGE 53

H. Lussier stressed that the new systems are object-code-compatible with Pyramid's earlier product lines and that field upgrade paths are available among the three new systems and the two earlier models of the 9000 series.

Lussier positioned the 9000 series as being strong in transaction processing and data base applications.

Pyramid's director of product marketing, Paul Lego, called the 9000 series machines "minimainframes" to differentiate them from the minisupercomputers used in the scientific and engineering communities.

Outgunning VAX 8000s

Lego said the 9840 was benchmarked using the TP1 transaction processing test and performed 30 transaction/sec. He claimed that other benchmarks showed the 9000 series to outperform competitors such as the Digital Equipment Corp. VAX 8000 family in power and in price/performance.

Lego also claimed that each Pyramid processor matches the performance of the DEC VAX 8700, with the four-CPU Pyramid 9840 performing the equivalent of 25 million instructions per second (MIPS) and the low-end 9810 performing 3.5 MIPS.

Pyramid also is expected to announce an add-on board that acts as an IBM 3274 controller for access to IBM's Systems Network Architecture networks and an IBM Application Programmers Interface.

Other products in pipeline

The company reportedly is introducing a Cobol 85 implementation and a 1G-byte disk drive as well.

The 9000 series supports up to 32 of those disk drives for a formatted capacity of 32G bytes.

The 9810, 9830 and 9840 are slated to be available in July.

The 9810 costs $90,000. The 9830 and 9840 cost $400,000 and $500,000, respectively, in base configurations including 32M bytes of memory, 32 RS-232 ports, 470M bytes of disk storage, a ½-in. streaming tape drive, a system console, Ethernet and a Pyramid OSX license, the vendor said.

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And third, it means you'd better start evaluating text management systems and vendors without delay. And there's no better way to begin that evaluation than by taking a close look at INQUIRE/Text—the most comprehensive, proven text management software system on the market.

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Traditional corporate information systems do a great job managing structured data. Unfortunately, the information most needed by decision-makers is often unstructured—embedded in the text of documents such as letters, memos, reports, contracts, and transcripts. Because this material has traditionally been beyond the reach of online systems, access to it has been slow, tedious, and error-prone. Word processors and other office automation systems have greatly accelerated document creation and distribution, but they are all but useless in making the actual information content of documents available as an online resource.

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Not surprisingly, the biggest text management system users have tended to be companies engaged in complex litigation or regulatory proceedings. But as text databases have proved their value in these initial applications, they have increasingly been used in others as well—from competitive intelligence gathering to online maintenance of technical documentation to a full array of corporate records management tasks. And as senior executives have become comfortable with text management facilities, they have increasingly mandated their use throughout the organizations that report to them.

The results: a dramatic improvement in the overall quality of information available to decision-makers. And a dramatic increase in pressure on MIS to deliver top-flight text management capability.

INQUIRE/Text: The features users need. The control you need.

As the demand for text management capability has grown, so has the number of vendors claiming to provide it. But few of these vendors offer the features, the flexibility, and the track record of Infodata's INQUIRE/Text.

INQUIRE/Text's automatic indexing and powerful keyword search and retrieval facilities have set industry standards in text management for years. INQUIRE/Text's easy-to-use menu screens, ability to handle both structured and unstructured fields, and flexible interfacing options have made it a hit with users in all departments, while also easing the tasks of the MIS personnel charged with implementing it. And INQUIRE/Text's track record in over $50 billion worth of litigation support applications—to say nothing of the rest—makes it easy to justify to top management.

INQUIRE/Text: It's the first thing you need to know about text management. ♦

INQUIRE/Text runs on IBM and compatible mainframes under MVS/TSO, MVS/CICS and VM/CMS.

Building

CONTINUED FROM PAGE 53

between 250,000 and 500,000 chips.

The computer then takes the design and its input on the functions of the chips and simulates the design of the entire computer. Next, Sullivan says, the system "goes on to actually design the printed-circuit boards. It lays them out." Finally, the system fabricates and tests the printed-circuit boards.

Sullivan says his project has been in the planning stages since 1976 when he started research with a friend, Theodore Bashkow, at Columbia University. "A year or so later," he adds, "we named it Chopp, which stands for Columbia Homogeneous Parallel Processor."

Through the research, Sullivan says, he and Bashkow came up with a set of concepts, which Sullivan later put into practice to begin designing the supercomputer. In 1979, Sullivan organized Sullivan Computer Corp. with seed money from a Boston venture capital firm. Research continued for the next six years.

From idea to reality

After receiving a U.S. patent for his shared-memory computer methods, Sullivan took his ideas to San Diego-based Science Applications International Corp. and asked for assistance in making his plans a reality.

Actual development of the unit began in mid-1985, when Sullivan received additional funding from a Canadian venture capital group that organized a public company, Chopp Computer Corp., to manage international sales.

In 1986, Sullivan Computer acquired Chopp Computer, thus regaining full control of its licenses and the Chopp name.

Science Applications International employs 25% of the staff working on the final development of the Chopp system. Science Applications International and Chopp personnel are currently building a single-processor demonstration unit that Sullivan claims will be faster than the Cray Research, Inc. XMP.

Carl Murphy, a Science Applications International vice-president, says the affiliation with Chopp will help his firm with future system integration projects by "putting the supercomputer in major applications."

"Right now, we are expecting that roughly around the end of the year we will have a prototype machine, and that we will be shipping computers next year," Sullivan says.

All told, Sullivan says he expects the development of the Chopp computer to cost in the neighborhood of $15 to $20 million.

The Chopp supercomputer "could be a real competitor [in the market] if everything goes right for them," says independent consultant Sid Fernbach in San Jose, Calif.

Chopp Computer Corp.'s Sullivan

Another thing to keep in mind, says analyst Jeffry Canin of Hambrecht & Quist, Inc. in San Francisco, is that "there are in the order of 50 companies that are either developing or shipping machines classified as parallel processors. I don't think it's too late to get into the market, but it's getting crowded."

Prices for the units will start at approximately $5 million at the low end, with a typical price hovering around $15 million, Sullivan says. But, he claims, supercomputers are cost-justifiable, and in one application a supercomputer might pay for itself in savings.

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nagement software?

Or from your
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But attorneys aren't the only ones who benefit from INQUIRE/Text. The very features that make INQUIRE/Text so ideally suited for legal applications also serve the needs of other departments such as planning, marketing, regulatory affairs, the library—and not least of all, MIS itself. In fact, INQUIRE/Text is a perfect system for the online maintenance of a wide variety of technical documentation. With its large capacity and flexible database facilities (including automatic backup and recovery, usage monitoring and accounting, and multilevel security), INQUIRE/Text protects the organization's interests while serving the individual.

This ability to meet both MIS and end-user needs is no accident—it was designed into INQUIRE/Text from the start. Which is one more reason why INQUIRE/Text is the place to start your investigation of text management software.

Speaking of which: if you've read this far, you probably know as much about text management as your law department does. So if they start presenting a case for text management, you've already got a case to present in return. A case for INQUIRE/Text. ♦

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NEW PRODUCTS

Processors

Force Computers, Inc. has announced the **SRAM-4**, a 32-bit static random-access memory board for VMEbus systems.

The board comes with 256K, 512K or 1,024K bytes of memory. Features include on-board voltage-sensing circuitry and on-board logic, which allows access to 16- and 32-bit environments.

Memory is arranged in two independent memory areas. The VMEbus interface uses fully latched address and data lines and interleaved write operations.

The SRAM-4 costs from $1,070 to $3,195, the vendor said.

Force Computers, 727 University Ave., Los Gatos, Calif. 95030.

Graphics systems

Ramtek Corp. has announced the **Ramtek 4660**, a display peripheral designed to perform image presentations and graphics generation.

The Ramtek 4660 display generator features up to 4.5M bytes of memory for storing display lists, programmable fonts, local functions and print buffers. The Video Module provides a 12-bit input, 28-bit output main video look-up table and an overlay look-up table. Other features include independent pan and zoom, support for up to nine four-bit refresh memory groups and pop-up windows.

The 4660 is priced at $18,700.

Ramtek, P.O. Box 58024, 2211 Lawson Lane, Santa Clara, Calif. 95052.

Terminals

Texas Instruments, Inc. has announced the **Multifile** application cartridge for its Silent 700 Travelmate 1200 terminal.

The Multifile cartridge is said to allow the Travelmate 1200 to store multiple files of information and provide an emulation of the VT-100 video terminal. The cartridge provides 576 lines of storage in up to 20 individual files. It is capable of automating the data collection and data communication processes with the host computer and includes a forms-generation capability as well as programmable autoaccess features.

Multifile is priced at $250. The Travelmate 1200 costs $1,295.

Texas Instruments, P.O. Box 809063, DSG-111, Dallas, Texas 75380.

Printers/Plotters

Mitsubishi Electronics America, Inc. has announced the **G650** high-resolution thermal-transfer color printer.

The G650 is said to be capable of printing on A- or B-size cut-sheet paper or on transparency film. It provides a resolution of 300 by 300 dot/in. Three- and four-color and black-only ink-sheet rolls are available.

The unit features an 8-bit parallel interface, built-in self-test and an enlarged picture mode offering four display formats.

The G650 is priced at $8,995.

Mitsubishi Electronics America, 991 Knox St., Torrance, Calif. 90502.

Decision Data Computer Corp. has introduced the **6415 laser printer** for use with IBM System/34, 36 and 38 minicomputers.

The 6415 is said to offer 15 page/min printing. It emulates the IBM 5219, 5224, 5225, 5256 and 4214 printer protocols and provides emulation of the Epson America, Inc. FX-80 printer when used with the IBM Personal Computer.

Features include a 250-page capacity input tray and 250-page collated output capabilities; resolution of 90,000 dots/in.; eight resident character fonts; 15 language character sets; and a selection of additional font cartridges.

The 6415 laser printer costs $7,995.

Decision Data, 400 Horsham Road, Horsham, Pa. 19044.

Auxiliary equipment

Dataproducts Corp. has announced the **8000 series** printer stand for use with the full range of its 8000 series printers.

The printer stand is said to be capable of supporting up to 200 lbs without vibration. It operates with both back- and bottom-feed printers and has two paper baskets to accommodate continuous-feed computer paper.

The 8000 series printer stand is priced at $169 with casters and $139 without.

Dataproducts, 9657 Mason Ave., Chatsworth, Calif. 91311.

Input devices

Houston Instrument, a division of Ametek, Inc., has introduced the **Scan-CAD Plotter Accessory** option for its DMP-50 series pen plotters.

The scanning input device is said to allow users of personal computer-based computer-aided design (CAD) and drafting systems to input up to E-size drawings. The Scan-CAD Plotter Accessory features a 200 dot/in. scan head capable of automatically scanning architectural, engineering and other CAD drawings from paper, vellum, acetate film or blueline.

The Scan-CAD Plotter Accessory costs $2,995.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

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...WHATEVER IT TAKES!

C invades final frontier: IBM 370 environments

Under MVS, C promises old-fashioned efficiency

BY DAN WOODS

"I don't think the mainframe programmers, like myself, have ever really had any great interest in the C language. What's so special about C?"

— Tony Kay
Informix Software, Inc.

IBM's announcement that it would offer a C compiler for its mainframes last August heralded the beginning of a new era for the C language. Strengthening IBM's commitment to C support was the recent announcement of the Systems Application Architecture (SAA) — a set of software interfaces, conventions and protocols that provide a framework for productively designing applications that are portable across IBM System/36 and 38, the 370 line and Personal Computer environments. C is one of three languages IBM promises to support in all of its computing environments.

Dan Boswell, associate director of the Computer Systems Group at the University of Waterloo in Waterloo, Ont., says, "Frankly, we see [C on IBM mainframes] growing by leaps and bounds." Boswell's group developed a C compiler for MVS, now marketed by a spin-off, Watcom Products, Inc.

About the only place any resistance to adopting C programming language can be found is in the system programming departments of IBM mainframe shops. Everywhere else, enthusiasm for C runs rampant.

Tim Hunter, manager of the 370 Library Group at SAS Institute, Inc., heads the group that is developing the runtime library for the IBM mainframe C compiler developed and currently marketed by SAS. Hunter says that intransigence in IBM mainframe environments is a simple matter of tradition.

"There are traditional languages like PL/I, Cobol and Fortran," he explains. "There is the traditional MVS environment, and Unix is seen as the upstart, being a totally different environment. It's just taking a long time for [the] MVS [community] to see C as a useful tool. But [acceptance has] started, it's growing, and we think it's going to continue to grow."

"One of the things that helps," he says, "is that IBM entered the marketplace eight months ago with a C compiler of its own, and that has attracted the attention of many people to C on IBM mainframes."

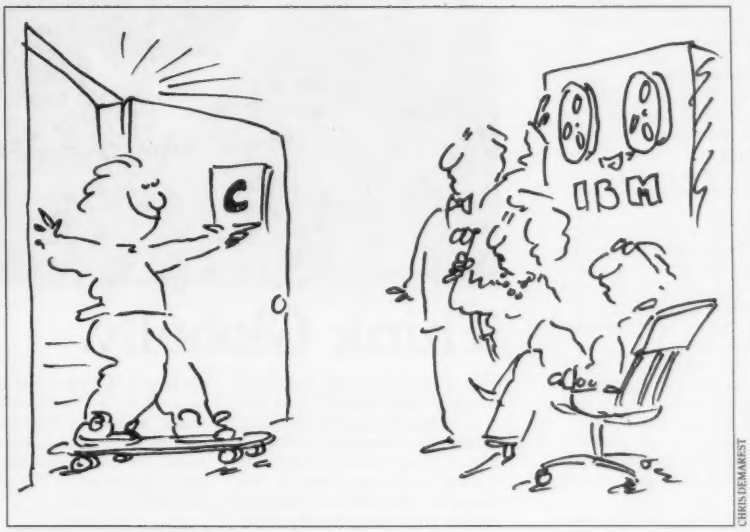
Why has IBM rolled out the red carpet for C, an offspring of AT&T Bell Laboratories? And if a shop decides to use C in the IBM mainframe environment on MVS or VM, what kind of performance can it expect from the available compilers?

What's so special about C?

Portability distinguishes C from all other computer languages. Because of the language's simplicity, it is relatively easy to write a compiler for C that produces reliable and efficient code for a computer of any size.

This fact has not gone unnoticed by software developers. A C compiler exists for every major mainframe, mini and personal computer operating system, and these compilers have been well used. A mountain of software has been written in C in a wide variety of environments for a diverse set of applications. All of this software is continually looking for a market.

By sanctioning C as a language for its mainframes, IBM has opened the floodgates for software written in C to enter the MVS and VM marketplace — the most lucrative software market in the world. Given the relatively low cost of porting software rather than redeveloping it from scratch and the fact



CHRIS DEMAREST

Woods is a computer scientist at Fame Software Corp. in Dexter, Mich., where he ports C code to the MVS environment.

- **Compilers from IBM, SAS and Waterloo**
- **Adapting Unix's quirks to MVS**
- **Six months until the last bug is out**

that mainframe software traditionally demands the highest prices, porting almost any application that offers even a slim chance of selling well will clearly be profitable.

It is important to note that portability is not a feature belonging solely to the C language but is also achieved through software engineering techniques designed to ease the task of porting. Only trivial programs will be able to compile and execute without modification on different machines using different operating systems. But if the modular design that isolates the machine dependencies of a program is employed, it becomes necessary to rewrite only 5% to 10% of a program to port it successfully to a new operating system.

C is also becoming more popular in IBM mainframe environments because it is easy to find programmers experienced in the language. University of Waterloo's Boswell, who heads a group that developed a C compiler for IBM mainframes, thinks that programmer availability is one of C's best features.

"Graduates from computer science programs at universities all seem to know and enjoy the C programming language," he notes. "Many, if not most, of the young programmers who are joining the ranks of professional data processing people are equipped with C and, in fact, like to work in the C language."

Finally, software developers find C attractive just based on its own merit as a computer language. In the hierarchy of languages, C falls between the second and third generations, a niche that has proved to be a useful one to occupy. C's capabilities enable a programmer to flip bits and manipulate memory at the lowest level, as you can in assembler language, and to use all of the higher level control structures — such as IF THEN ELSE, SWITCH and WHILE — as well as user-defined types that are common in third-generation languages. Some people call C "algorithmic assembler language."

Get more code written

The experience of Paul Cress, senior programming consultant at Canada Systems Group in Mississauga, Ont., clearly illustrates the merits of C compared with those of second-generation language assembler and PL/I, a third-generation language.

Canada Systems developed a textual data base searching system that runs on MVS and is not intended to be portable. The system was originally developed in PL/I and assembler. Now Cress is gradually replacing both the PL/I and assembler language components with C.

The PL/I code troubled Cress not because he could not write the necesary routines in the language but because the IBM PL/I optimizing compiler was unreliable. PL/I is a much more powerful language than C in that it offers a programmer many more features. But when language designers set out to provide a large degree of functionality for programmers, they create nightmares for the compiler writers. Whenever Cress tried to maintain the application software or the PL/I compiler, he found new bugs in the compiler.

In addition to being unreliable, the code generated from the PL/I compiler was also much larger and therefore used more memory than the comparable code from the C compiler. After he replaced the PL/I code with C, "we got about a 4-to-1 improvement in terms of memory utilization," Cress says.

> "MANY of the young programmers who are joining the ranks of professional DP are equipped with C and, in fact, like to work in the C language."
>
> DAN BOSWELL
> UNIVERSITY OF WATERLOO

Cress replaced the assembler code with C code for different reasons. Programs written in assembler language are generally faster than programs that have been translated into machine language by a compiler. The problem with assembler language is that it is difficult to find and train assembler language programmers, and the code they write is difficult to maintain.

Productivity was the issue that dictated the replacement of assembler with C. "By going to C [from assembler], we felt we could get more code written, more productivity using people with different skills that didn't require detailed assembler knowledge," Cress says.

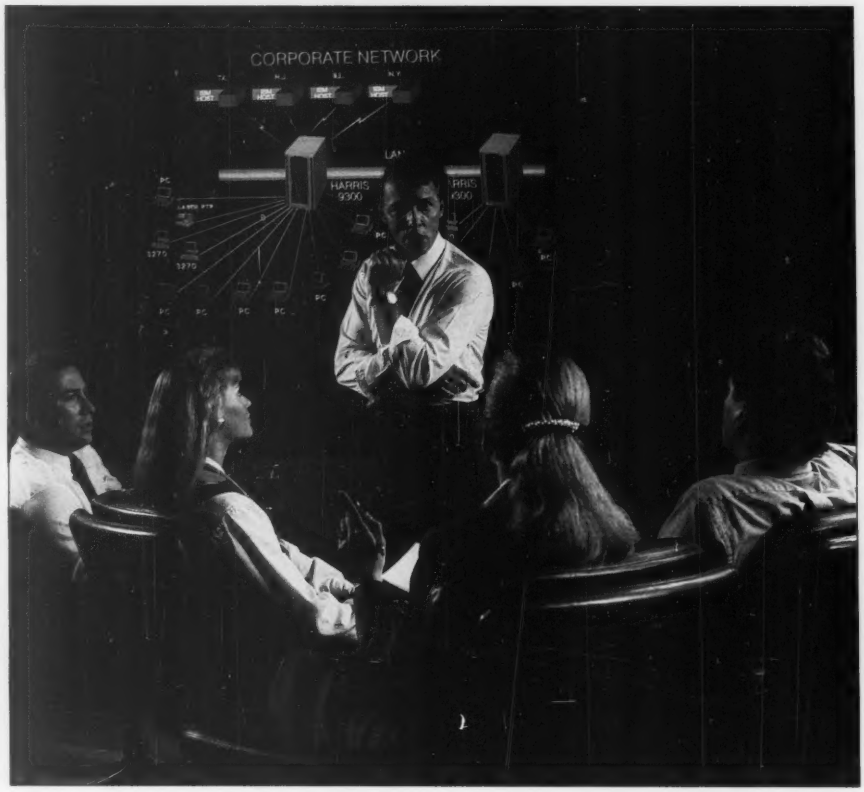
He also felt the cost of reduced efficiency would be quite low: "You can get almost as efficient and direct code out of C as you can by hand-coding it in assembler."

The players

In theory, there is no difference between theory and practice, but in practice, as most programmers know, there is practically no similarity between theory and practice. This maxim applies to C compilers for IBM mainframes.

Although the three compilers below perform acceptably, none is free from major problems.

IBM/Whitesmiths. Whitesmiths Ltd. in Concord, Mass., and Unisoft AB, a



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C compilers for MVS

Compiler/ Vendor	Introduced	Operating Systems	Installed Base	Current Version	License Price
C for IBM IBM/ Whitesmiths Ltd.	First-quarter 1984	MVS, MVS/XA, VM/CMS	Several hundred	Version 3.01	$5,000 (purchase)
SAS/C Compiler SAS Institute Inc.	November 1985	MVS, MVS/XA, VM/CMS	251	Version 3.00	$3,600/year (first year)
Waterloo C Watcom Products, Inc.	June 1984	MVS, VM/CMS	225	Version 1.3	$1,800/year

INFORMATION PROVIDED BY THE VENDORS
CW CHART

small software development house in Goteborg, Sweden, developed the compiler currently offered by IBM. Whitesmiths sold C compilers for IBM mainframes for several years before joining forces with IBM. It enhanced the 3.0 version of its compiler to comply with IBM's requirements.

The compiler, when purchased from IBM, is called the IBM C Licensed Program Version 1.0. Code generated by the compiler executes on VM/CMS, MVS and MVS/XA. Provided with the compiler are a source-level debugger as well as an interface to DL/I under IMS.

SAS Institute. When SAS decided to rewrite its software from scratch, it chose C as the source language for portability and efficiency reasons. After surveying the available compilers for the IBM mainframe market, SAS decided that its best interests lay in writing its own C compiler.

By developing its own compiler, SAS could maintain complete control of the software development process. It entered into an agreement with Lattice, Inc., developer of a C compiler for microcomputers, to adapt that company's compiler to the IBM mainframe market; SAS later acquired Lattice in December 1986.

SAS initially decided to develop a compiler to satisfy its own development needs, but after possessing a working C compiler, the company set out to fill a void that it felt existed in the marketplace. The first version of the SAS C compiler, Version 2.10C, was released in November 1985. SAS subsequently released Version 3.00 last December.

SAS cites 251 installed bases for its mainframe C compiler, which is only available through a license. It also sells a cross-compiler that executes on IBM mainframes and produces object code for IBM Personal Computers. Programs written with the C compiler will execute on VM/CMS, MVS and MVS/XA.

Watcom Products, Inc. The C compiler developed by the University of Waterloo's Computer Systems Group was first released for use under VM/CMS in June 1984. The MVS Version 1.2 was released in August 1985; Version 1.3 was released a year later. Programs written with the C compiler execute under VM/CMS and MVS/SP but not under MVS/XA in 31-bit address mode. Waterloo C is now in operation at 225 sites on VM/CMS and MVS.

Philosophical differences

The problems that affect all three of these C compilers do not stem from the difficulty of implementing C on an IBM mainframe. Rather, they originate in the differences between the IBM and Unix operating systems, particularly the systems' philosophies of input and output. Waterloo's Boswell had to reconcile these problems when he managed the development of the Waterloo C compiler.

"The C model of I/O is very close to the Unix model of I/O, and the MVS world couldn't be more different," he explains. "A great deal of work is required to adapt the MVS style of I/O and operating system features and reconcile that to the C programmer's way of doing things."

The basic difference between the Unix and MVS I/O models centers on file organization. Unix sees most files as a stream of characters, while MVS sees most of them as a collection of records.

Kay, technical manager at Informix, a software house that ports data base tools to the IBM mainframe environment, evaluated both the SAS and the IBM/Whitesmiths C compilers. (He did not evaluate the Waterloo compiler.) Kay says he does not believe the C language can handle MVS I/O access methods correctly and still remain portable.

"The SAS and Whitesmiths compilers have made extensions to the language in order to handle MVS I/O properly. That extension is going to stop portability," he says.

Documentation is also a major problem being addressed by all three developers.

"One of the criticisms I have of both the SAS and Whitesmiths compilers is that the documentation is terrible," Kay says. "Not the C language documentation itself but the internal runtime library

Act Locally.

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documentation. It's very sloppy. As far as Whitesmiths is concerned, there is none. SAS said that they realized it and that they were in the process of correcting the problem."

Low quality

Kay also suggests that the support for SAS and IBM/Whitesmiths do not come up to his expectations. He says, "It isn't up to the quality that you would expect for normal mainframe products on IBM."

All of the above problems can be considered growing pains for C in the IBM mainframe market. None of the problems are insurmountable, and most of them result from the fact that everyone involved in C is new at playing the "C compilers for IBM mainframes" game. Problems unique to each compiler are as follows:

IBM/Whitesmiths

- Slow compile time.
- Version 3.0 on MVS shows difficulty in producing listings.
- Very large source files cause the Version 3.0 compiler's code generator problems.
- Version 3.0 on MVS appended "$H" to all header file names, thereby limiting header file names to six characters.

SAS Institute

- LSEEK support is restricted to data sets that have a RECFM=FBS and an LRECL=1 on MVS. To be processed, files that do not have this data set organization are copied to temporary files that do.
- One must release a transient library with programs using the SAS compiler. Although this process simplifies maintenance of the library, many developers bristle at the complexity of the installation.
- Object code produced by the SAS compiler must be link-edited with the SAS linker.
- No source-level debugger is offered.

Watcom Products

- MVS/XA is not supported by the runtime library.

It is important to recognize that none of these problems will prohibit development. They may make things more difficult — but not impossible.

Pressure improvements

C in the IBM mainframe environment offers advantages to a variety of users and inevitably will be accepted by the IBM mainframe community, no matter how much it rankles a few crusty MVS system programmers. It is impossible to overemphasize the importance of IBM's support of C in its mainframe environments.

Consider the attitude of Informix's Kay: "When IBM announced it was going to support the Whitesmiths compiler, the decision was really cut-and-dried as far as I was concerned," he says. "If IBM is going to stay behind the Whitesmiths compiler, then improvements are going to be made because pressure will be brought." Throughout the IBM mainframe computer community, C is being transformed from a vague possibility into a likely reality.

Every problem with the compilers mentioned in this article is currently in the process of being solved. If you are a software developer eager to port a product to the IBM mainframe environment, you can start now with any of them. In six months to a year, you will own your own trouble-free C compiler. •

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MANAGEMENT

TAKING CHARGE

Eric K. Clemons

The elusive advantage

There is widespread and continuing interest in information systems and their effects on business strategy; there is particular interest in information systems that can convey sustainable competitive advantage for innovative and aggressive firms. But there is a growing realization that competitive advantage may be more difficult and more elusive than initial reports have led industrial practitioners to expect.

One hypothesis is that many strategic applications of information systems have proved to be strategic necessities. Such systems must be developed to match a threat from a competitor; they are clearly necessities. But since competitors often develop equivalent systems at about the same time, they seldom convey competitive advantage. Many applications examined in corporate finance, retail banking and distribution systems have proved to be strategic necessities, despite initial expectations to the contrary.

Perhaps the earliest example of a strategic technology not conveying advantage was the first battle involving armor-plated warships: Somehow the image of the Monitor and the Merrimack futilely slugging it out in an inconclusive naval battle conveys precisely the point we want; neither the North nor the

Continued on page 70

Decentralization faces doubts

NEW YORK — The trend toward decentralization of corporate information systems is still increasing, although questions about the costs and benefits of the change may modify the trend, according to a study by The Diebold Research Programs.

In the meantime, decentralization is having a drastic impact on MIS departments and senior MIS managers, altering the functions of the organizations and sometimes resulting in a new job, new employer or early retirement for the executives, according to the study, which focused on such impacts.

While corporations pushed for centralization of information systems through the early 1970s to generate greater efficiency, the trend during the past decade has been toward decentralizing systems to the operating units they serve.

The decentralization has been driven by the arrival of minicomputers and microcomputers that are powerful but relatively inexpensive and easy to maintain, along with increasingly sophisticated communications systems, and by the growing understanding of information systems by line managers.

Cutting costs has not been a factor motivating decentralization; it may cause corporations to spend more money on information systems. But businesses have pursued decentralization in an effort to generate greater returns on their expenditures, generally with success, the study found.

While the trend toward dispersal of information systems continues in line with a general movement toward decentralization on the part of corporations, it has come in for re-examination as some senior managers have questioned its costs and returns, the Diebold study says.

There is little consensus over what functions a corporate MIS department will perform after decentralization of applications into line units, the study reports. But it finds key issues to be ad-

Continued on page 73

Data View

Breakdown of MIS budgets

Average of 732 responses from survey of 10,000 sites

	Percent
Data processing hardware	29.2
Data processing software	9.9
Communications	9.7
Office systems	2.2
Factory systems	1.1
Service bureaus	0.9
Other outside services	2.7
Salaries/Benefits	38.5
Other operations	5.7

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.

ADAPSO to lobby Feds for systems approach

BY DAVID A. LUDLUM
CW STAFF

ARLINGTON, Va. — ADAPSO, the computer software and services trade organization, has formed an Information Systems Integration Committee to try to persuade federal government officials to adopt a systems integration approach to procurements.

ADAPSO hopes to persuade federal procurement officials to address information systems issues by contracting for an integrated system rather than ordering specific hardware, according to Robert Laurence, chairman of the ADAPSO committee and vice-president of Systemshouse, Inc., a Virginia-based systems integration firm.

With the federal government's present focus on hardware specifications, its procurement process takes too long, so the hardware purchased is sometimes outdated and does not adequately define the function to be performed, Laurence said. The procurement process "tends to be technology oriented as opposed to functionally oriented. It focuses on technology as opposed to providing services of government. It tends to complicate the discussion of what is ultimately to be done by the system," he said.

As an example, Laurence said, the Department of Defense might ask contractors to propose a solution to a particular problem rather than seek a computer with a certain speed and specified number of disk drives and workstations. ADAPSO's members include such systems integration firms as Boeing Computer Services and Electronic Data Systems Corp. as well as hardware vendors that supply software or systems.

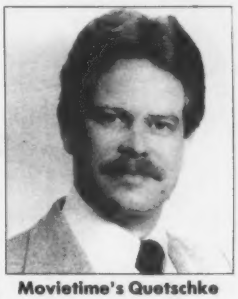
MANAGERS ON THE MOVE

Bringing high-tech to cable TV

BY DAVID A. LUDLUM
CW STAFF

Joining **Movietime Channel, Inc.** as director of network services offers **Phillip Quetschke** a chance to take what he calls the relatively unsophisticated computer technology in the cable television world one step further.

In June, the Los Angeles company plans to launch Movietime, a 24-hour national cable television channel featuring entertainment news, highlights of current



Movietime's Quetschke

films and listings of theater and cable TV movies customized for each local cable system.

Movietime will download movie listings compiled by Tribune Media Services on a Digital Equipment Corp. VAX-11/780, process text on an Atex, Inc. system and merge the text with still photos with an AT&T Targa photo-digitizing system. Then the data will be sent over a network that will address IBM Personal Computer ATs at each cable system.

Quetschke, 39, formerly an

Continued on page 69

BOOK REVIEWS

'Infotrends' offer trillion-dollar business

Information Technology: The Trillion-Dollar Opportunity
By Harvey L. Poppel and Bernard Goldstein

General Motors Corp. acquires Electronic Data Systems Corp. Several of the country's largest banks, retailers and technology companies form videotex partnerships. A raft of businesses, from American Airlines to Weyerhaeuser Co., offer computer and information products and services to vertical markets.

In the fluid world of information technology, users are intermingling and even becoming suppliers to the point where it is increasingly less relevant to think of a distinction between the two.

That undeniable trend underlies the approach that Harvey Poppel and Bernard Goldstein, players in the game of high-tech mergers, acquisitions and venture capital, take to a mega-industry they call information technology in the book they have subtitled *The Trillion-Dollar Opportunity.*

In an ambitiously sweeping but terse volume, the authors, partners in the firm Broadview Associates, take a look at what is happening in the six segments of the mega-industry they identify — communications services, information services, entertainment services, consumer electronics, office equipment and business operations equipment.

The authors then take the reader through a five-part tutorial on how to manage information technology businesses in general, considering financial and accounting concerns, strategic management, people management, product quality and marketing.

But before any of this discussion, Poppel and Goldstein lay out a framework or environment against which their more practical considerations emerge. This approach takes the form of a chain reaction of five "infotrends" — driving forces affecting the components of information technology.

The infotrends start with growing importance of content,

Continued on page 72

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NETWORKING

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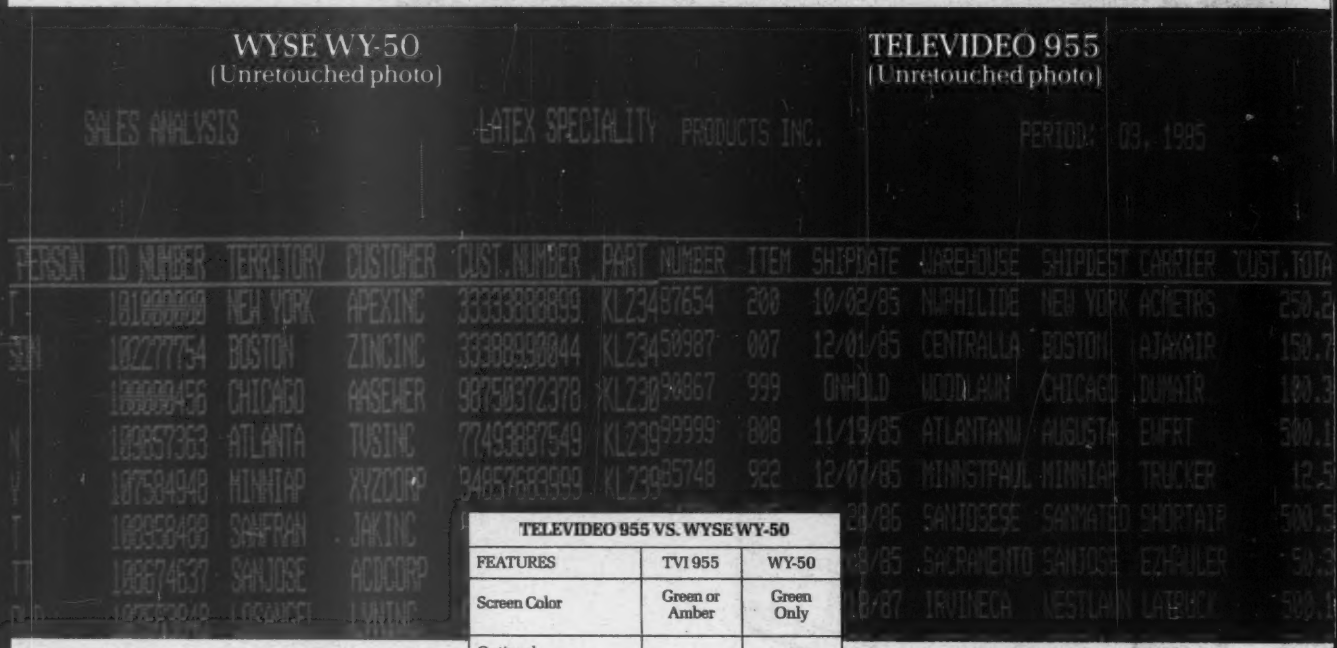
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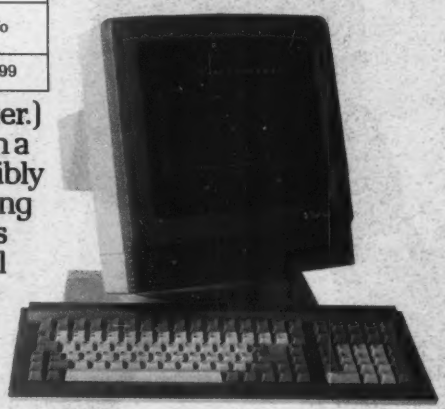

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High-tech

FROM PAGE 65

independent consultant and director of information systems at Falcon Communications, Inc., a cable system operator based in Pasadena, Calif., is responsible for implementing all technical operations.

"Typically, the things you're going to see in cable television are pretty unsophisticated. What we have done is take the technology one step further to include imagery," he said.

Gerald Long has been appointed vice-president of network operations at **Private Satellite Network, Inc.** in New York, a provider of business television networks.

Previously, Long worked at Argo Communications Corp., where he directed the operations and maintenance of Argo's digital network of switches, earth stations and microwave facilities.

He was also a senior operations manager at RCA Americom with responsibility for installation, operation and maintenance of all transmission facilities of video and data satellite networks. He instituted RCA's first network control center and trouble-call center.

Chemical Bank has promoted four information-technology executives to the post of senior vice-president.

Dennis Forand heads the payments group of the financial services division, which includes domestic and international funds transfer and telecommunications. He joined Chemical in 1965 and handled various assignments in corporate trust and retail operations before moving to the payments group in 1984.

James H. Kelley Jr. heads information and technology services in the retail operations division, which provides systems development support and technology services for consumer banking group functions, including branch automation, automated teller machines, product development, check processing, credit cards and customer service systems. Kelley joined Chemical in 1984 in its retail operations section.

John F. Nastro heads the architecture and infrastructure unit of the information and technology management division, which provides systems development support for corporate systems and systems integration services. He joined Chemical in 1963 and has been group head for computer services and senior project manager for the Somerset, N.J., regional data center.

Jeremiah F. O'Leary heads the securities and trust services in the financial services division, which provides processing and support services for mortgage-backed and debt securities as well as securities safekeeping services. O'Leary joined Chemical's auditing division in 1976 and moved to the metropolitan division in 1977 and the operations division in 1982.

Robert G. Milne has been named to the newly created position of vice-president of corporate services at **Candle Corp.** in Los Angeles.

Milne is responsible for operations, purchasing, materials handling, management information systems, telecommunications, data processing and diversified group-level projects.

Previously, Milne held the position of senior director of management services at Candle, which is a developer and marketer of performance management software for IBM mainframes.

John Beveridge was recently appointed deputy auditor for management information systems and electronic data processing auditing for the **Department of the State Auditor of Massachusetts.**

Since 1984, Beveridge has been an EDP audit specialist at Bank of Boston Corp. Prior to that, he was EDP audit manager, data processing manager and assistant budget director at the Massachusetts Department of the State Auditor.

Eugene A. Stiefel has been named to the post of vice-president of information services at **Hunt Manufacturing Co.**, a maker of office and arts-and-crafts products in Philadelphia.

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Advantage

CONTINUED FROM PAGE 65

South gained any advantage from this innovation — at least in this first battle — yet it was immediately clear that the days of wooden warships were numbered.

We believe that structural differences among firms are a primary source of competitive advantage through information technology; they form a primary source of competitive advantage for any means through which this advantage is pursued.

Applications of information technology may convey some advantage, assuming they are good ideas and the marketplace will demand them. They will convey sustainable advantage if any of the following conditions are met:

- Your competitors cannot duplicate your innovation or, through constant improvement, you can remain ahead of your competition.
- You have preempted the marketplace, customers will accept only one system and will not switch and the adoption of your system is so rapid that there is simply no market left to compete for by the time your competitors can act.
- Competitors do not want to copy your innovation.
- Competitors cannot benefit from copying your innovation.

Examples of sustainable advantage through the first two means exist but are far less common than a trusting first scan of the MIS literature would imply. After some thought, this is probably not surprising. It is difficult to keep an idea secret; it is difficult to keep improving an idea faster than competitors who are not tied to an older technology; and it is difficult to get a product adopted fast enough to preempt a market.

We have not seen, in the MIS literature, references to advantage protected through the third or fourth means, yet these seem to be far more promising. When American Airlines first introduced its travel agent reservation system, no other major airline was willing to cooperate in its development. Each had a reason. TWA, for example, relied heavily on through-traffic originating in Europe, while Eastern Airlines relied heavily on its shuttle services, which required no reservations. This is clearly an example of an innovation that competitors did not want to copy.

Competitors will not benefit from copying an innovative application if its benefits do not derive directly from the information system but rather from ways that the application exploits unique resources possessed by the innovator but not by its competitors. This, in essence, converts an untapped comparative advantage of the innovating firm into a competitive advantage. Such advantages can be defended because competitors lack the non-MIS resources needed for duplication and often cannot readily obtain these resources.

As always, an example should help to make these concepts clear. We consider here a vertically integrated manufacturer of sweaters that manufactures and distributes sweaters and sells them through its own retail outlets. The manufacturer has an information system that provides timely and accurate sales information. It exploits this by maintaining semifinished inventory rather than finished goods inventory. For example, it keeps an inventory of sweaters that are finished but not yet colored; the sweaters can then be dyed to meet demand rather than manufactured for inventory, and they can be shipped where stock is needed, as opposed to where demand is expected.

Obviously, this reduces cost. And clearly this could not be done by a less integrated manufacturer. Copying the sales information system — even copying the sales, manufacturing, inventory control and distribution systems — would be of limited benefit to a less-integrated manufacturer. The manufacturer in this example has converted a potential, comparative advantage into a competitive one. The manufacturer's unique position makes it impossible for competitors to erode this advantage simply by duplicating the information systems.

Organizational model

In order to locate opportunities to exploit information technology, it is necessary to develop a model of the firm and of where and how information systems can be used within an organization. The model of the firm we have been using is based on the value chain, in which nodes represent activities through which a firm creates value, and arcs represent the flow of goods, services or information.

We use an industry value chain rather than a firm value chain; thus, activities continue across the boundaries of individual organizations. The degree of vertical integration of a firm is represented by how far its value chain extends, while the degree of diversification is seen by the number of parallel value chains.

Therefore, we expect to see information technology used to manage interactions within the firm, particularly those not already handled within individual business units by the firm's existing hierarchical control structures, and to manage interactions across the boundaries of the firm, especially for sales, order entry, service and support. Perhaps most valuable is the ability to create synergies by combining products or services from different business units; cash management accounts are probably the best known examples of this.

Clemons is an associate professor at the University of Pennsylvania's Wharton School.

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You can use IUCV and VMCF to communicate between programs across processor boundaries in an SSI complex.	With IBM's ISF, you can't use IUCV and VMCF across processor boundaries.
An SSI complex supports up to 33 processors.	IBM's ISF is limited to two CPUs.
SSI dynamically switches virtual machines from one processor to another to satisfy user requirements. This means a user's terminal and virtual machine can be on different CPUs. As a result, duplicate software licensing and maintenance charges can be reduced or eliminated.	IBM's ISF offers no switching capability.
You can use any version of VM/SP or VM/HPO in an SSI complex.	IBM's ISF requires that you use HPO 4.2.
SSI balances the user load automatically.	IBM's ISF doesn't do load balancing.
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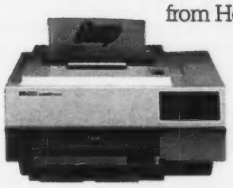

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Or you can create a sophisticated combination of text and graphics. With additional plug-in memory, you can also produce full-page 300 dpi graphics, like our Nuts form shown below. To do this, we used HP's new ScanJet desktop scanner, Microsoft Windows and Pagemaker® from Aldus.

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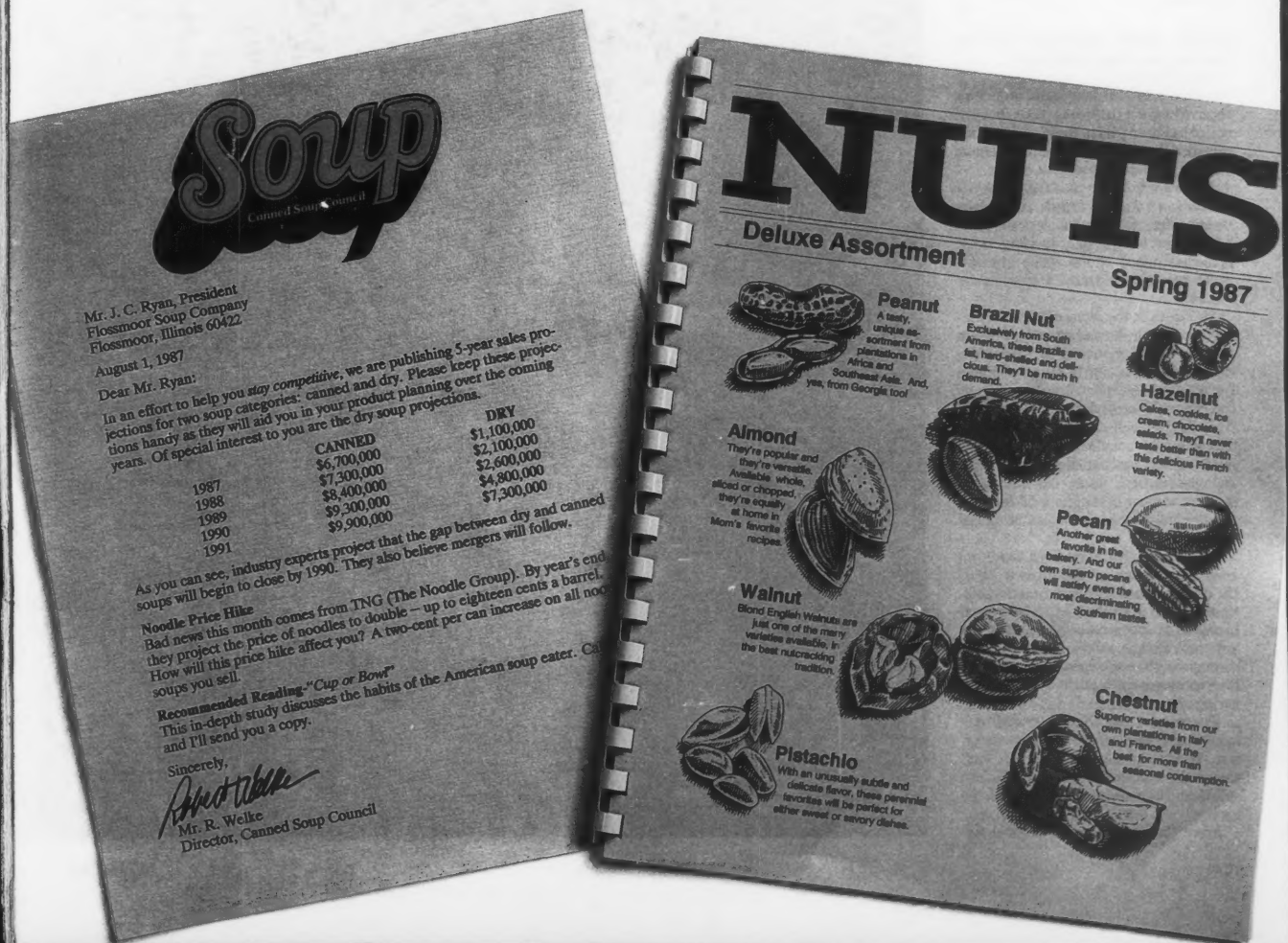

Soup
Canned Soup Council
Mr. J. C. Ryan, President
Flossmoor Soup Company
Flossmoor, Illinois 60422
August 1, 1987
Dear Mr. Ryan:
In an effort to help you stay competitive, we are publishing 5-year sales projections for two soup categories: canned and dry. Please keep these projections handy as they will aid you in your product planning over the coming years. Of special interest to you are the dry soup projections.
CANNED
DRY
1987 $6,700,000 $1,100,000
1988 $7,300,000 $2,100,000
1989 $8,400,000 $2,600,000
1990 $9,300,000 $4,800,000
1991 $9,900,000 $7,300,000
As you can see, industry experts project that the gap between dry and canned soups will begin to close by 1990. They also believe mergers will follow.
Noodle Price Hike
Bad news this month comes from TNG (The Noodle Group). By year's end they project the price of noodles to double — up to eighteen cents a barrel. How will this price hike affect you? A two-cent per can increase on all noo soups you sell.
Recommended Reading. "Cup or Bowl"
This in-depth study discusses the habits of the American soup eater. Ca and I'll send you a copy.
Sincerely,
Mr. R. Welke
Director, Canned Soup Council
NUTS
Deluxe Assortment
Spring 1987
Peanut
A tasty, unique assortment from plantations in Africa and Southeast Asia. And, yes, from Georgia too!
Brazil Nut
Exclusively from South America, these Brazils are fat, hard-shelled and delicious. They'll be much in demand.
Hazelnut
Cakes, cookies, ice cream, chocolate, salads. They'll never taste better than with this delicious French variety.
Almond
They're popular and they're versatile. Available whole, sliced or chopped, they're equally at home in Mom's favorite recipes.
Pecan
Another great favorite in the bakery. And our own superb pecans will satisfy even the most discriminating Southern tastes.
Walnut
Blond English Walnuts are just one of the many varieties available, in the best nutcracking tradition.
Chestnut
Superior varieties from our own plantations in Italy and France. All the best for more than seasonal consumption.
Pistachio
With an unusually subtle and delicate flavor, these perennial favorites will be perfect for either sweet or savory dishes.

Infotrends

CONTINUED FROM PAGE 65

such as software and data, relative to facilities, or hardware. That, in turn, places a premium on interoperability — the accurate and efficient exchange of content. In business transactions, greater interoperability can cause disintermediation — elimination of the middle man. Disintermediation can result in globalization of markets.

Finally, in a less straightforward cause-and-effect relationship, the authors credit all four of these trends with the fifth — convergence, or the melding of various components of the information technology world, such as vendors and users, products and services, hardware and software and information and entertainment.

The Trillion-Dollar Opportunity tends toward the detached, analytical view of the sociologist when it comes to consumers and toward the grids and matrixes of the management consultant (Poppel is formerly of Booz, Allen & Hamilton, Inc.).

And the book is unabashedly bullish on information technology.

But Poppel and Goldstein do well by starting with a dynamic, unifying framework and then, stressing the fifth infotrend, taking a broad view of information technology and its converging components, juxtaposing several that are not often considered together.

Hardcover, $19.95, 207 pages, ISBN 0-07-050511-X, by McGraw-Hill Book Co., New York, N.Y.

DAVID LUDLUM

Crunch Mode: Building Effective Systems on a Tight Schedule
By John Boddie

Software project management in general receives a great deal of attention, but less notice has been paid to those projects that require design teams to expend maximum effort in the minimum amount of time.

In *Crunch Mode: Building Effective Systems on a Tight Schedule*, author John Boddie offers project managers and team leaders his insight into tackling these time-constrained efforts while attempting to maintain the sanity of everyone involved.

He offers as the focus of his book productivity, "not as measures in 'lines of code per week' or some other sterile statistic, but as the ability to get working software 'out the door.' "

Using as a framework the elements of typical structured software design, Boddie offers in counterpoint the special needs of the crunch-mode project: ongoing specification; visual illustration instead of textual description; ad hoc, as-you-go design reviews instead of formal walk-throughs.

He stresses the need for a top-down approach throughout the project: "It is the only approach that gives you the ability to judge the effect of development problems in one area on the rest of the system." Boddie offers as an example throughout the book a project drawn from his experience in the field of on-line wagering systems.

The project team is the critical element in any successful crunch-mode effort. Boddie, keenly aware of this fact, makes the team members, their pitfalls and their successes a focal point of the book.

From the start, the professional and personal interactions of team personnel present the human element of the design process, and individual factors and outside influences that can help or hinder their work are discussed.

Boddie makes no claims to possessing a formula for success. Rather, by discussing what has worked for him, he offers managers who are currently or who may in the future be in a similar position a shot at survival.

While the book is not always well organized in its presentation, it offers insight and good advice on a new facet of a common problem.

Hardcover, $26.67, 183 pages, ISBN 0-13-194960-8, by Yourdon Press/Prentice-Hall, Inc., Englewood Cliffs, N.J.

DEBORAH FICKLING

BOOKS IN BRIEF

1-2-3: The Complete Reference
By Mary Campbell

Commands and procedures are detailed in typical business applications; a handy desktop reference to the Lotus Development Corp. software.

Paperback, $22.95, 892 pages, ISBN 0-07-881005-1, by Osborne McGraw-Hill, Inc., Berkeley, Calif.

The Pick Operating System
By Malcolm Bull

A manual to complement the documentation of Dick Pick's operating system.

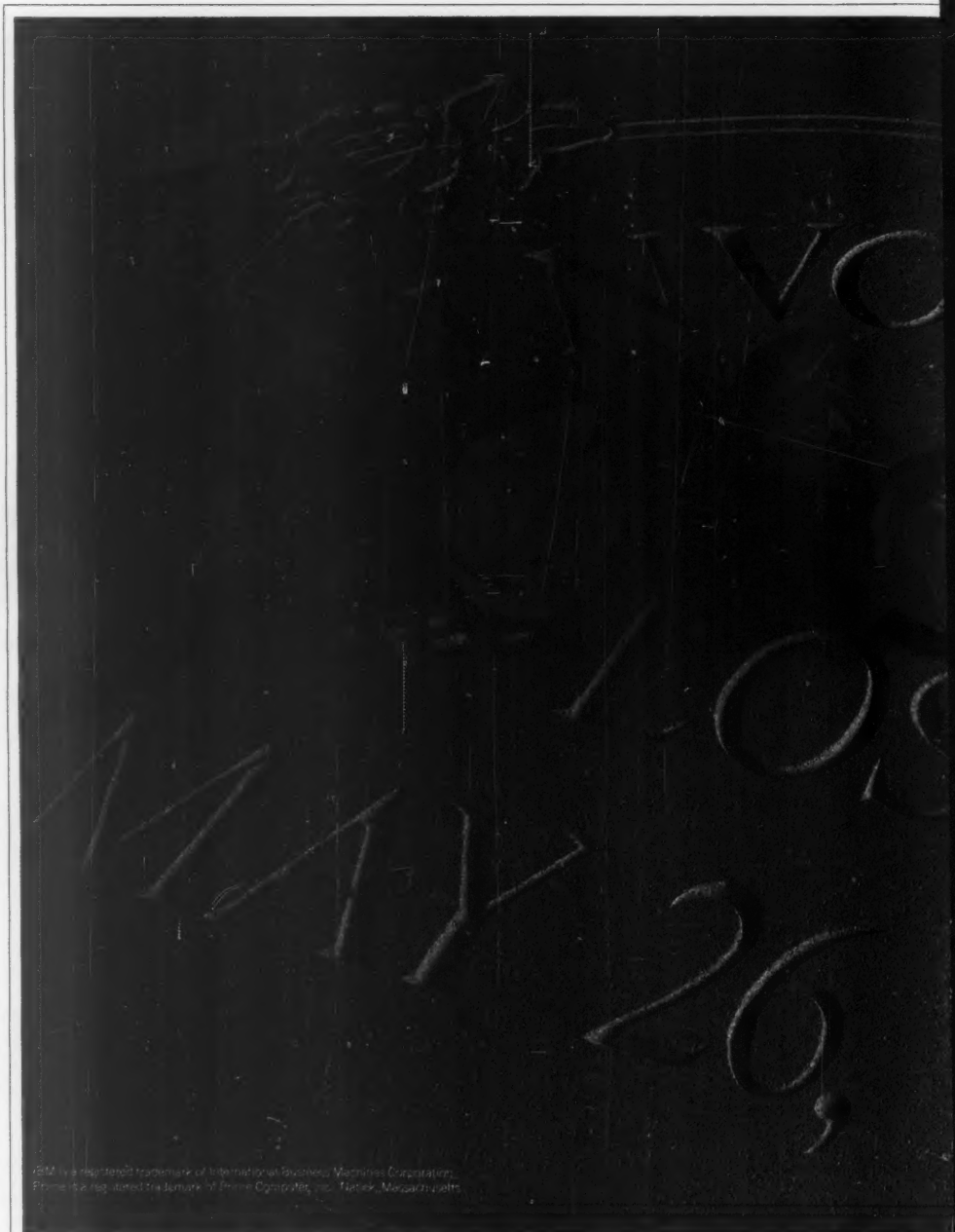
Paperback, $28, 412 pages, ISBN 0-412-28050-7, by Chapman & Hall, New York, N.Y.

Information Center: Strategies and Case Studies
By Shaku Atre

A constructive exploration of what works and what does not in an information center. The thesis: A well-structured center can show a return on investment for the corporation.

Paperback, $38.95, 251 pages, by Atre International Consultants, Inc., Rye, N.Y.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.



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CALENDAR

MAY 10-16

International Conference on Expert Systems and the Leading Edge in Production Planning and Control. Charleston, S.C., May 10-13 — Contact: Libby Shropshier, Institute of Information Management, College of Business Administration, University of South Carolina, Columbia, S.C. 29208.

APL87. Dallas, May 10-14 — Contact: APL87 Registrar, Suite 210, 440 Northlake Shopping Center, Dallas, Texas 75238.

VIP '87 — Duquesne Systems International Users Group. Chicago, May 11-12 — Contact: Donna Bartko, Duquesne Systems, Inc., Two Allegheny Center, Pittsburgh, Pa. 15212.

Audit Managers' Symposium IX. Hilton Head Island, S.C., May 11-13 — Contact: Jane Evans, MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

National Info/System User Group Conference. Philadelphia, May 11-13 — Contact: Mike Turgeon, Northeast Info/System User Group, P.O. Box 1698, Boston, Mass. 02205.

CD-I/The Future Conference. San Francisco, May 11-13 — Contact: Carol Peters, Online International, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

Desktop Publishing '87. San Francisco, May 11-13 — Contact: Carol Peters, Online International, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

APICS Logistics Conference and Technical Exhibit. Dallas, May 11-14 — Contact: Communications Department, American Production and Inventory Control Society, Inc., 500 W. Annandale Road, Falls Church, Va. 22046.

Intercompany Networks: Strategy and Implementation. New York, May 12-13 — Contact: William Smulsky, The Yankee Group, 200 Portland St., Boston, Mass. 02114.

MAP/TOP Users Group Meeting. Pittsburgh, May 12-13 — Contact: MAP/TOP Users Group, Technical Activities Division, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

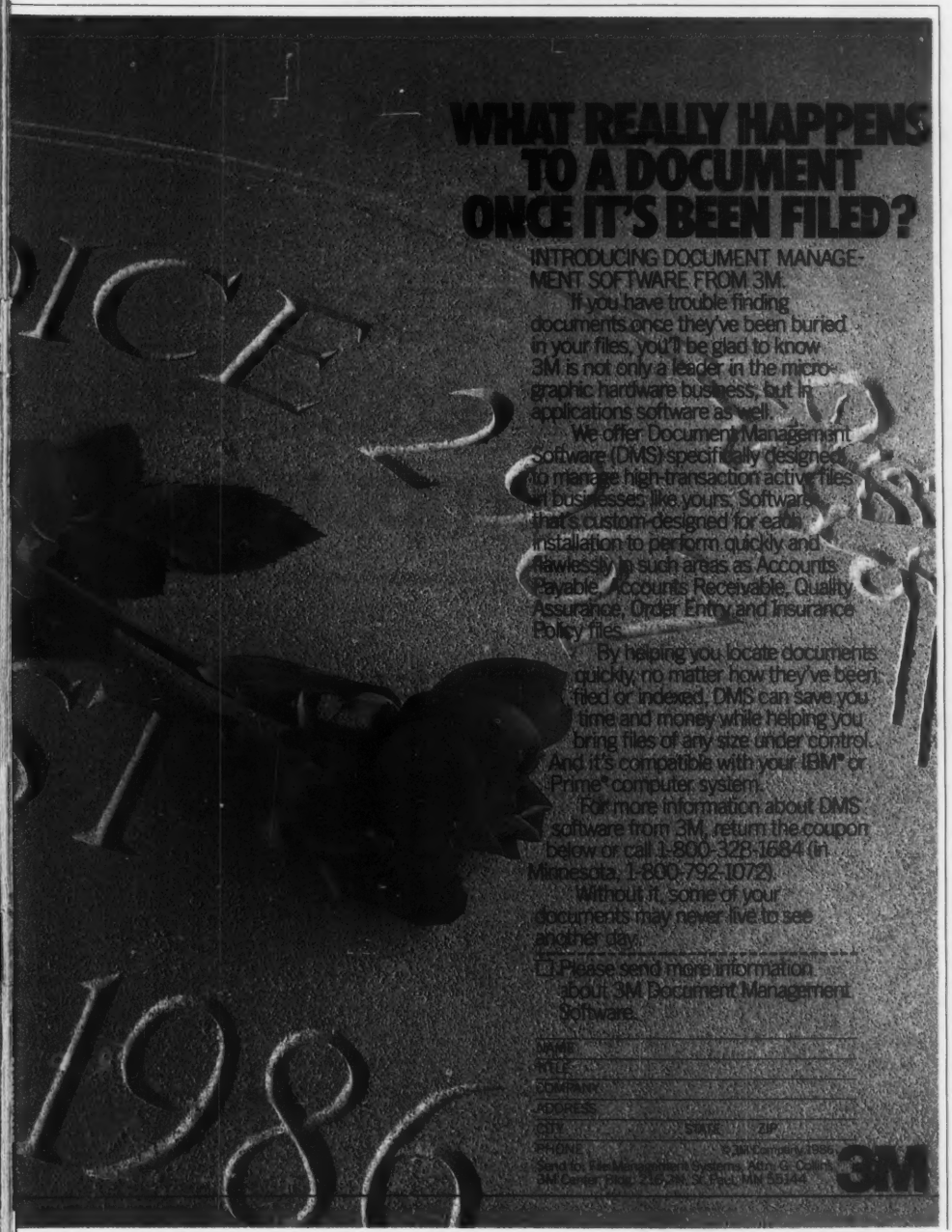
Fiber Optics & Optical Disks. Hyannis, Mass., May 12-13 — Contact: International Optical Telecommunications, Inc., 720 Main St., Hyannis, Mass. 02601.

Infobase '87 — International Database Exhibition and Congress. Frankfurt, West Germany, May 12-14 — Contact: Messe Frankfurt GmbH, Ludwig-Erhard-Anlage 1, POB 97 01 26, D-6000, Frankfurt 97, West Germany.

The Information Advantage. London, May 13-14 — Contact: The Conference Board, Inc., P.O. Box 4026, Church Street Station, New York, N.Y. 10261.

Avignon 87 — Expert Systems and their Applications. Avignon, France, May 13-15 — Contact: Avignon 87, B.P. 45, 92193 Meudon-Cedex, France.

Network Users Association Spring Meeting. Atlanta, May 13-15 — Contact: Network Users Association, Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.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Decentralization

CONTINUED FROM PAGE 65

dressed consistently include the following:

- Managing the telecommunications network.
- Supporting the corporate office.
- Establishing standards, policies and procedures.
- Insuring the stability of the data base.
- Developing the MIS organization into a facilitator and consultant.

As for managers who remain with a corporate MIS staff after decentralization, the top one generally focuses on supporting senior executives, while others might advise and audit divisional MIS operations, the study said.

The report contends that the concept of a single, corporatewide data base has disappeared. "It has become quite clear that in most corporations, each line of business is nearly autonomous," the study reported.

It also noted that the advent of the home computer may have been a significant force behind decentralization of information systems in raising the awareness of computers among line managers.

"Increasingly, line management has grasped the idea that it must have control of the information technology to support its operations," the study said.

"The demystification process caused by the home microcomputer may well turn out to be a major element by virtue of how it has encouraged and assisted corporate executives to recognize computing's potential importance," the study reported.

MERGING two large banks can produce significant economies of scale. It can also produce significant programming headaches if the two have different computer systems.

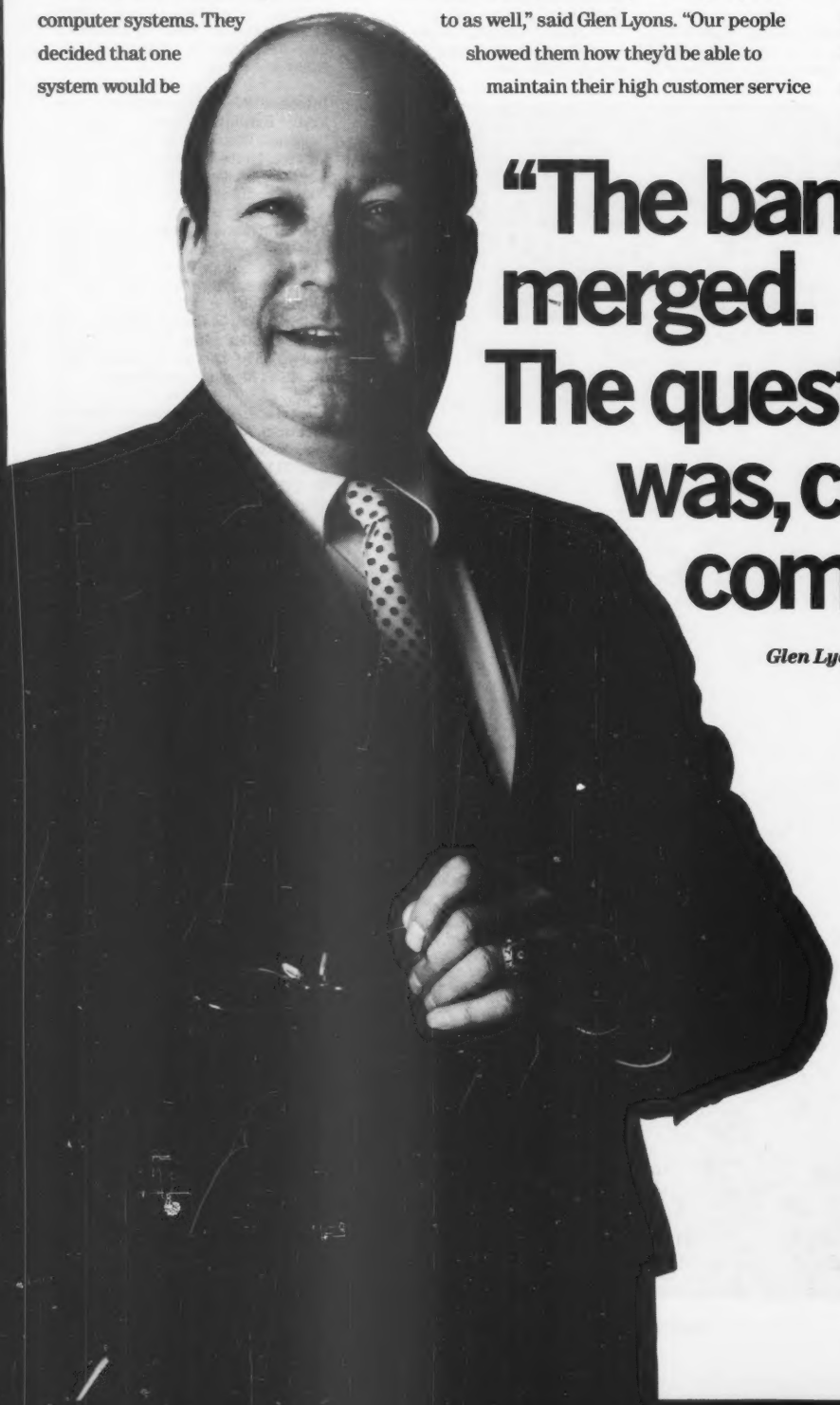
When the Bank of Virginia, a 22-year Unisys customer, merged with a Maryland bank to form Signet, the banks had to decide how to use two very different computer systems. They decided that one system would be assigned to the new organization's retail business, and the other system to the commercial business.

Since Signet is strongly customer-oriented the big question was, whose equipment would be assigned to handle the retail business?

"The bank has always cared a lot about their retail customers, and they expect us to as well," said Glen Lyons. "Our people showed them how they'd be able to maintain their high customer service standards, even with 90 new branches, without any interruption of service.

"They knew that we could do it. The bank has grown fast for many years, and Unisys has always kept pace with them. And Signet has never had to rewrite their software.

"It's been real rewarding to work with bankers who care so much about their customers. We work with them so closely, they think of us as family now. That's really the power of 2."



"The banks merged. The question was, could their computers?"

Glen Lyons, District Manager, Unisys.

UNISYS

The power of 2

COMPUTER INDUSTRY

OUTSIDE LINES

Bohdan O. Szuprowicz

In search of top portable

When it looks like and takes no more space than a box of expensive cigars, every business executive in the world will want one on his desk. And if the cigar box becomes a knowledgeable advisor about his specific business, the exec won't be able to leave home without it.

Portable, hand-held and laptop computers have been on the market for several years already, but despite extremely optimistic forecasts in the early 1980s, they have failed to develop into a booming industry.

Now, with considerable end-user feedback and results from extensive market research by vendors who have survived, the most desirable features of a laptop portable computer have been determined. Companies are racing to be the first to market with what is seen as the "ultimate portable."

None are more serious than the suppliers of conventional desktop personal computers, because they all know that an ultimate laptop design could become a replacement for the bulky desktop models nowcluttering offices.

Display is critical

The most critical feature of laptop computers is the display, and the failure of many earlier models is directly attributable to the screen limitations of their original flat-panel displays. For maximum user satisfaction, a laptop display should be comparable in clarity and legibility to the 80-column CRT monitors of desktop computers.

Already, laptop displays have become larger and clearer with the introduction of supertwist LCD technology. Electroluminescent and plasma flat-panel displays are also in the running, and plasma displays are expected to offer color within two years. But these technologies are relatively more expensive and consume more power than LCDs.

As better and clearer displays become available, users will increasingly want to have an option to upgrade them by trading in the original display for the latest model. Toshiba

Continued on page 77

On-Line rides success of CICS

BY ALAN ALPER
CW STAFF

FORT LEE, N.J. — On a hill overlooking the majestic George Washington Bridge sits a high-rise building containing the offices of On-Line Software International, Inc. On-Line's perch offers a dazzling view of New York and its environs — home of the world's largest installed base of IBM computers.

On-Line's proximity to New York has certainly helped establish the company as a premier IBM-compatible systems software house. The 18-year-old company's success, however, transcends its location.

The leadership and technological insight provided by On-Line's low-key but decisive founding father, Jack Berdy, has transformed this former small-time consultancy into a fast-growing international vendor of software for IBM CICS environments.

Bucking trend

While some independent systems software companies suffered earnings declines during the past year following a period of unrestrained growth, On-Line has prospered because its core products monitor and test the performance of CICS, a vital software system in many DP shops.

For the nine months ended

On-Line founder Berdy

March 31, On-Line's net income has almost doubled, to $3.2 million, from the comparable period last year on a 40% revenue gain to $42.2 million. Roughly 80% of the firm's revenue comes from its systems software business, with the balance derived from training and consulting.

"We're not in applications, and that's a key point, since that portion of the business is vulnerable to specific industry market trends," Berdy says. "We're in utilities and end-user software — add-ons to IBM software to make it easier to use."

Continuity at the helm

On-Line thrives, analysts point out, because of continuity at the helm and the firm's ability to retain executives, who average nine years of tenure with the company. Berdy's leadership is the glue that holds the company together.

"Jack Berdy is one of the great technologists who has survived as a chief executive officer in the software business," notes Bernard Goldstein, partner at Broadview Associates, a software and services investment banking firm also located in Fort Lee. "He's had the good sense to bring in talented executives around him to help run the company."

One such talent is Howard Sorgen, a former MIS executive at Manufacturers Hanover Trust Co. who was named president and chief operating officer last August.

Another is Richard Granger, senior vice-president of marketing, who joined On-Line after years as an executive in the marketing-driven cosmetics business.

Last fall, On-Line raised software industry eyebrows with the acquisition of software from Martin Marietta Data Systems, including well-known products like Ramis, a fourth-generation language and data base management system, and application generator UFO.

The move not only broadened On-Line's portfolio but provided the telemarketing-oriented company with its first direct sales force to handle many of its more

Continued on page 78

Akers hazy about IBM rebound

BY CLINTON WILDER
CW STAFF

NEW ORLEANS — In an annual meeting marked by the continuing controversy over IBM's sales of computers to South Africa, IBM Chairman John F. Akers gave little indication last week whether IBM's profits will rebound as the computer industry enters an apparent upturn.

Akers said that IBM's first-quarter shipments exceeded year-earlier levels for the first time since 1985 and cited unspecified "encouraging signs" but cautioned that "the worldwide economic situation remains unsettled."

Akers refused to elaborate when questioned by reporters after the meeting adjourned. "You heard my remarks, and I have nothing more to add to them," he said.

No shareholders in attendance, however, had asked Akers to further discuss the business situation.

Most questions concerned IBM's continuing product sales to apartheid-torn South Africa through Information Services Management Ltd., IBM's for-

Continued on page 82

Data View

1987 first-quarter earnings

Most vendors report robust results, but AST Research and Convergent Technologies continue to struggle.

Company	Net Income Jan.-March (millions of dollars)	Percent Change From 1986	Revenue Jan.-March (millions of dollars)	Percent Change From 1986
AST Research, Inc.	3.4	−47	55.4	+33
Comshare, Inc.[1]	0.4	—	17.4	+3
Convergent Technologies, Inc.[2]	(11.0)	—	73.5	−18
Convex Computer Corp.	2.1	+295	14.4	+92
Duquesne Systems, Inc.	2.2	+96	9.7	+81
Maxtor Corp.	8.0	+105	53.9	+103
Miniscribe Corp.	6.1	+29	61.4	+52
Rexon, Inc.	2.0	+145	24.2	+77
Storage Technology Corp.	14.3	+186	180.6	+12

Parentheses indicate loss
[1] Year-earlier loss of $229,000.
[2] Year-earlier profit of $2.1 million; revenue includes $20.4 million from Convergent Business Systems.

CW CHART

MCI must battle FCC, AT&T in tough telecom market

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Rebounding from a depressing fiscal year with a profitable first quarter, MCI Communications Corp. says it must battle federal regulators as well as competitors to succeed in its present low-cost niche in the long-distance U.S. market.

President and Chief Operating Officer Bert Roberts recently told a packed meeting of the New York Society of Security Analysts that MCI's future financial health is contingent on the company's success as a low-cost provider. That success depends in large part, Roberts said, on the outcome of certain regulatory issues now before the Federal Communications Commission.

Roberts called for the FCC to eliminate those stringent rate-of-return restrictions that forced AT&T to cut interexchange service prices by an average of 9.5% last year. In order to maintain its position as a low-cost provider, MCI had to introduce equivalent cuts, which resulted in significantly lower 1986 profits, Roberts emphasized.

MCI's latest round of rate decreases, scheduled to take effect March, are likely to result in an

Continued on page 78

Chief's surgery

MCI Chairman William McGowan underwent heart surgery April 25, MCI said last week. His condition was not disclosed at his family's request. McGowan suffered a heart attack in December.

Retire Your PC Coax Connection

The PC-to-host coax connection. She was a good piece of equipment working with coax cable and cluster controllers, but time just passed her by. End users started needing more than simple host access. They also needed their PCs to share resources around the office. That's when local area networks came along to fill the need.

LANs are dramatically increasing office productivity through efficient information management. And Gateways are exploiting LAN versatility by providing cost-effective host communication for PCs and other network devices. Now for thousands of dollars less, LANs and Gateways provide PC-to-PC and PC-to-host communications all without a cluster controller.

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NICKELS & DIMES

Xerox Corp. announced income from continuing operations in the first quarter ended March 31 was $135 million, compared with $102 million in the first quarter a year ago. Earnings per share were $1.25, a 34% increase from 93 cents earned last year.

Combined revenues from business products and systems and financial services in the quarter were $3.3 billion, an increase of 17% from $2.8 billion a year earlier.

Chips & Technologies, Inc. announced revenue for the third quarter ended March 31 of $22.8 million, compared with $4.3 million in the previous year. Profits were $3.6 million, or 27 cents per share, compared with $788,000, or 6 cents per share, in the like quarter last year.

Emulex Corp. reported revenue for the third quarter ended March 29 of $25.8 million, compared with $27.2 million last year. Profits were $1.3 million, or 10 cents per share, compared with $2.3 million, or 16 cents per share, in the previous year.

Software AG Systems, Inc. announced revenue for the third quarter ended Feb. 28 of $15.3 million, compared with $14.6 million one year ago. Profits were $194,000, or 3 cents per share, compared with $1.6 million, or 27 cents per share, a year ago.

Ask Computer Systems, Inc. announced revenue for the third quarter ended March 31 of $25.4 million, a 44% increase over revenue of $17.6 million for the like quarter last year. Profits were $1.7 million, or 13 cents per share, compared with $1.4 million, or 11 cents per share, for the like period a year ago.

Innovative Software, Inc. reported net income of $1.3 million, or 50 cents per share, on revenue of $5.9 million for the third quarter ended March 31. This compares with net income of $718,963, or 35 cents per share, on revenue of $3.6 million reported in the like period a year ago.

Timeplex, Inc. announced revenue for the third quarter ended March 31 of $38.3 million, compared with $30 million last year. Net income was $4 million, or 43 cents per share, a 149% increase over net income of $1.6 million, or 19 cents per share, for the like period a year ago.

Contel Corp. announced net income for the first quarter ended March 31 of $54.7 million, or 71 cents per share, compared with $49 million, or 64 cents per share in the like quarter last year. Revenue was $723 million, compared with $697.1 million last year.

Top portable

CONTINUED FROM PAGE 75

Corp. already upgrades the screens of its portable at the factory, but the ultimate portable is expected to have a user-replaceable display capability.

Maximum portability and minimum footprint also translate into user-acceptable weight and size limitations. Ideally, weight should not exceed five pounds because then, a laptop computer has maximum utility and is more likely to be taken on trips whether or not it will be needed. The ideal size would easily fit into a briefcase, with room to spare for notes and a newspaper as well.

Size and weight, in turn, depend on the product's heaviest components, including the display, keyboard, disk storage and batteries. Current batteries last one to three hours, but this is often not acceptable to users.

Research suggests that six hours, the duration of a transcontinental flight, is the minimum battery life that should be offered in a laptop. This prerequisite, in turn, conflicts with the need for high-speed processing.

Laptops almost exclusively use 3½-in. disk drives for storage, which will also be used in the next generation of IBM microcomputers. These disks are now approaching 100M bytes in capacity at the high end, and laptops with 1.4M-byte floppy disks and 20M-byte hard, 3½-in. microdisks are already on the market.

In order to reduce power consumption and weight even further, 2½-in. disk drives are being developed.

The laptop keyboard is expected to remain in its present form for the foreseeable future because it is the most difficult item to improve on with new technology or design. However, the ultimate portable could gain greater customer acceptance if the keyboard of even a five-pound portable could be removable for greater user convenience.

Connectivity with existing desktop microcomputers is apparently a very desirable characteristic that will most likely be a standard feature on most laptops in the future. Access to various business data bases from remote locations will be increasingly important. Another desirable feature is an optional printer that could be attached to a portable computer by the user when his work warrants taking it along.

Needless to say, IBM compatibility is de rigueur for all portable computers. But the greatest opportunity lies ahead for those software developers that can turn these devices into portable executive advisors, complete with specialized knowledge bases manipulated through the use of artificial intelligence microprocessors and expert systems software.

Szuprowicz is president of 21st Century Research in North Bergen, N.J., and publisher of *Supergrowth Technology USA*.

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MCI battles

CONTINUED FROM PAGE 75

unprofitable second quarter, predicted John S. Bain, senior-vice president at Shearson Lehman Brothers, Inc. Bain gave a long-term positive outlook for MCI, however, based on a large and growing long-distance market and industry consolidation.

The proposal to deregulate AT&T is "a good offensive strategy" that could help both MCI and U.S. Sprint Communications Co. maintain viability in the face of divested Bell operating companies that might try to buy them out as a means of entry into the long-distance market, commented Philip Sirlin, a research analyst at Sanford C. Bernstein & Co. in New York.

Once AT&T is free of rate-of-return restrictions, it is more likely to increase profits than to continue attacking its competitors with price cuts. "A healthy MCI and Sprint are AT&T's big protection against the operating companies' getting into the long-distance business," Sirlin said.

Local-access charges constitute a far more serious drag on MCI's bottom line, accounting for approximately 50% of the revenue dollar, according to MCI's Roberts. "We are asking state PUCs [public utilities commissions], Congress and the FCC to increase Bell operating companies' regulations, since they still have bottleneck control and a 12% rate of return that is out of line with the rest of the industry," he said.

MCI's current strengths, as cited by Chief Financial Officer William Connolly, include an emphasis on cost control, exemplified by the organizational restructuring and write-offs of late last year, an expected decrease in capital spending and an extensive optical-fiber network now in place. MCI's nearest competitor, U.S. Sprint, is "where we were three years ago" in terms of the geographic reach of its fiber-optic network, Roberts said.

Sirlin disagreed with Roberts' assessment. "Of the three [major carriers], I think MCI has the most catching up to do in digital services. Little of Sprint's digital network is active now, but it will do a big cutover in the next three months," the analyst said.

On-Line's success

CONTINUED FROM PAGE 75

complex products. The acquisition is also expected to help On-Line increase international sales.

"Currently, less than 7% of our revenue comes from outside of the U.S. Most companies get about 30% to 40% outside of the U.S.," Berdy notes. "We wanted to build a larger presence internationally."

Although the acquisition of the Martin Marietta products and sales force is complete, the two companies are still finalizing payment terms in the aftermath of a recently completed audit. One topic of discussion is the value of intangible assets, Berdy says, which made up slightly more than half of the acquisition.

"The purchase started at $38 million and went down to $34 million," Berdy says. "At closing, they gave us back another $2 million and we're still arguing about another million."

While some independent software companies have depended on acquisitions for continued growth, On-Line has not. "If you subtract out the acquisition, we're still growing at 35%," Berdy points out.

Although Berdy declines to show his hand, On-Line is contemplating other acquisitions that are IBM systems software-related but not competitive with IBM. The firm recently completed a $40 million convertible-bond offering that should give it the financial maneuverability required to strike while the iron is hot.

The company is also bringing out internally developed products. On-Line says it plans to formally introduce an application generator called Intelagen next month to compete head-on with Pansophic Systems, Inc's Telon. Aimed at departmental users, the software lists for $80,000.

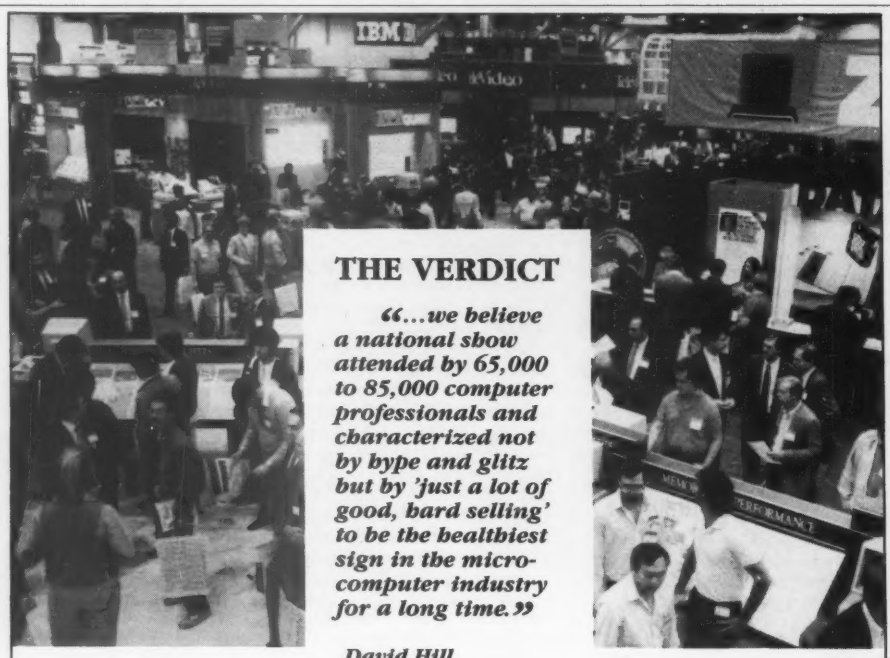
The company is not following other independent software vendors into the much-acclaimed Digital Equipment Corp.-compatible market. On-Line is, however, considering porting software to the DEC market, which is a less expensive alternative than starting development efforts from scratch.

"We know IBM, and that's what we're staying with," Berdy says. "The DEC world is overstated; for people who want to fight it that's fine, but it's not for us."

With 25,000 CICS sites worldwide, On-Line is content to serve its natural market, which is growing at roughly 10% annually. "We've only penetrated 10% to 15% of the total market," Berdy explains. "There's a lot of profit potential for us."

Scott Smith, an analyst at Donaldson, Lufkin & Jenrette, Inc. in New York, is high on On-Line. He says he envisions the company maintaining its lofty growth rates because of its ability to retain customers and because of customers' insatiable needs for maintenance. On-Line, he says, is perfectly positioned, because 60% of most companies' software budgets are spent on maintenance. On-Line's maintenance products, Verify and Stabilize, have little competition, Smith says, while Intertest, its 8-year-old program testing and development product, continues to bring in record revenue.

While opportunities abound, On-Line is also quick to phase out product lines that do not fare well. For instance, the firm's high-end, mainframe-to-micro link, Omnilink, and a no-frills version called Free-Link are being "de-emphasized" after a couple of years of heavy prospecting met with unsatisfactory results.



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David Hill
Editor
MICRO MARKETWORLD
11/24/86

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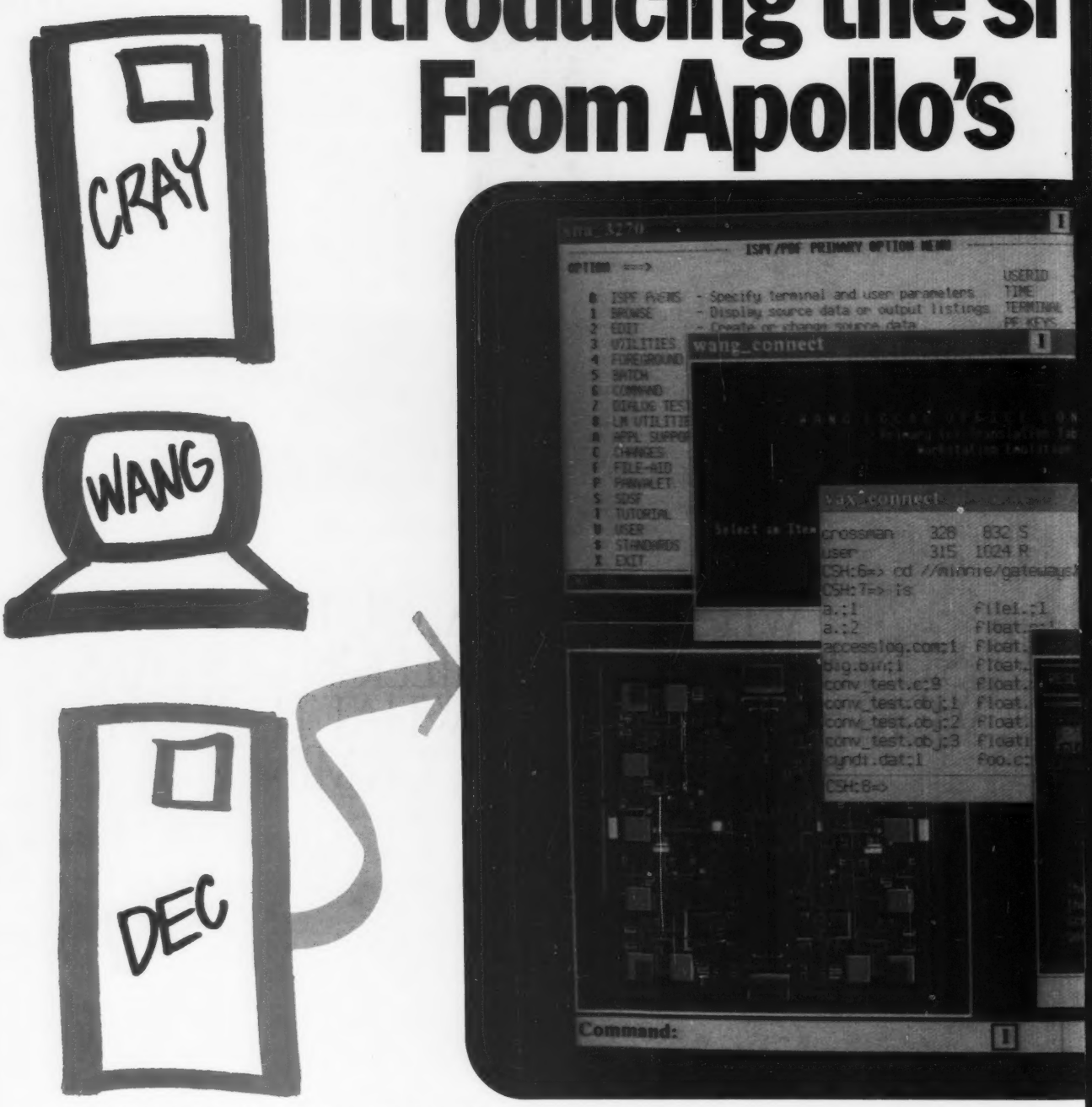

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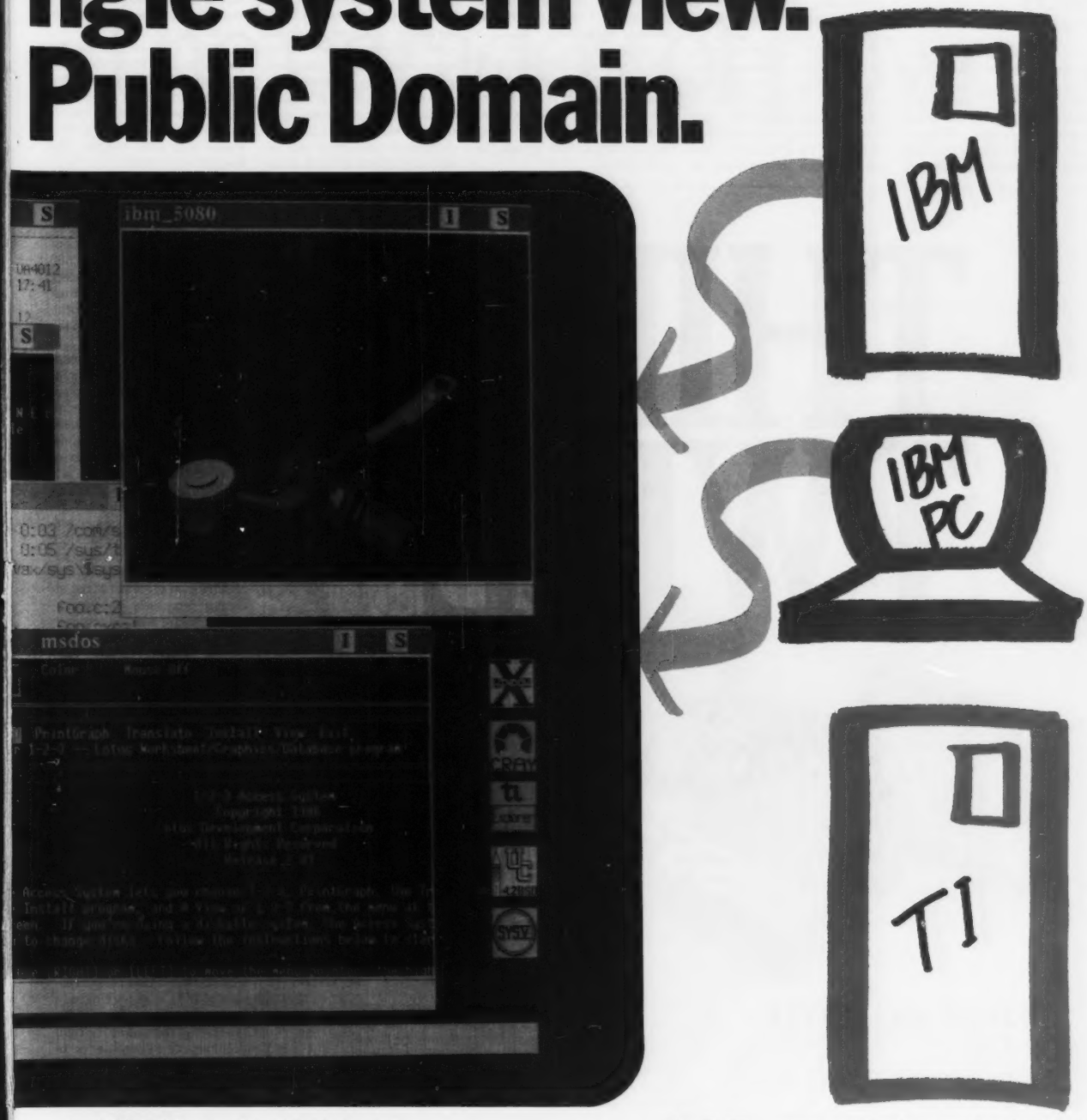

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Akers

FROM PAGE 75

mer Johannesburg-based subsidiary that it sold to its South African employees last year [CW, Oct. 27, 1986]. A shareholder resolution to prohibit sales to Information Services Management was defeated by approximately 95% of the shares voted, but comparable proposals in past years calling for withdrawal from South Africa were defeated by similar margins.

"IBM has changed the name on the door, but its products continue to bolster the apartheid economy," said Kurt Jones of American Baptist Churches, one of several clergy representatives who called for a ban on product sales. Several antiapartheid activists conducted a peaceful protest outside the New Orleans Convention Center, where the meeting was held.

Akers admitted that the volume of products IBM is shipping for South African distribution is about the same as it was before the Information Services Management sale. But he urged stockholders to vote against the product ban.

Akers said the sale of the business to its employees maintained "the general principles of IBM's personnel practices, including equal opportunity" and "benefit levels consistent with other leading South African employers."

In his prepared speech, Akers detailed the cost-cutting measures, product introductions and stepped-up marketing and advertising efforts at IBM in the past year, noting "a transformation of this company — unquestionably one of the most rapid in our history.

"It is a transformation not just to fend off the problems of the moment," Akers said, "but to change the shape of the company for the long term . . . to ensure its competitiveness in a world that gets tougher and tougher every year."

He noted that IBM has relocated or engineered job changes for 14,000 employees worldwide, including the slashing of 7,000 headquarters positions and the redeployment of 1,500 U.S. managers. Through early retirement programs and attrition, IBM has reduced its worldwide work force by 11,000 in the past year.

"We are doing far more to inform our customers about our future product directions," Akers said. He predicted that the number of IBM sales representatives and systems engineers will show a 20% increase over 1985 levels by the end of this year.

Akers cited several business priorities in the company's attempt to improve customer service, including shorter product cycles, simplified contract paperwork, more flexibility on maintenance agreements and increased emphasis on applications software and systems integration.

"We are making the IBM company easier to do business with," he asserted.

High price of advertising

In other business, Akers, in response to a shareholder's question, defended the high expenditures for advertising the new Personal System/2 microcomputer line, including glossy 24-page inserts in the business and trade press.

"If you only get a half-page ad, it gets lost in the clutter," Akers said. "We're trying to gain attention, although some think we overdo it."

Akers sharply defended IBM as "not antiunion" in response to remarks by Lee Conrad, an organizer of IBM Workers United, a fledgling in-house union. "We have always recognized the right of employees to organize or to refrain from organizing," Akers said. "But our employees in the U.S. have never expressed their need for a union and never felt it was in their best interest."

Separately, IBM promoted three executives to the vice-president level, including Larry J. Ford, assistant group executive for marketing and support for the Information Systems Group.

Also named were Joseph M. Guglielmi, assistant group executive for plans and controls for the Information Systems and Storage Group, and M. Bernard Puckett, the Information Systems Group's assistant group executive for plans and controls.

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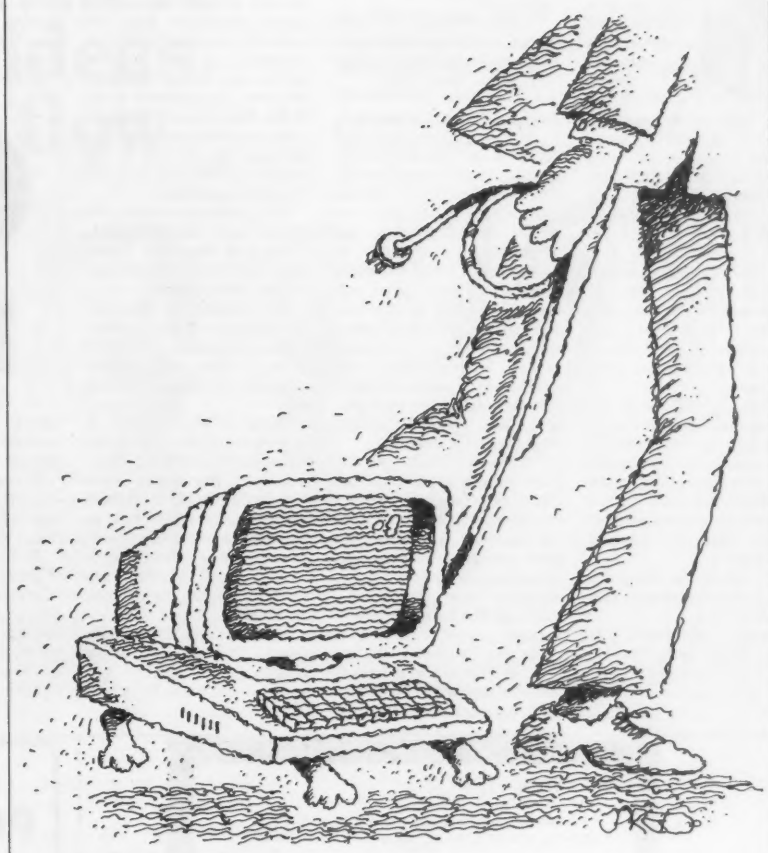

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Ducking the corporate punches

Flexibility key to survival during takeovers or mergers

BY LINDA CORMAN
SPECIAL TO CW

One day in December 1985, the 16-member MIS staff of Clevepak Corp. in Purchase, N.Y., got the word that seven of them would be gone in a week as a result of the company's acquisition by Ditri Associates, Inc. in Greenwich, Conn., and Great American Management & Investment, Inc. in Chicago.

As Pat Baxter, then manager of office automation, began to digest the news on the way back to her office, the manager of programming sidled up to her and snidely said that she was a definite goner.

Baxter, the last one hired in the department, could not argue.

But the programming manager was gone the next week, during the first cut, and five months later, Baxter decided to leave of her own accord to become president of a computer documentation company.

Why was Baxter allowed to stay and the programming manager released?

Flexibility, Baxter says.

MIS professionals who roll with the punches stand a better chance of holding onto their jobs during a merger or acquisition, according to those who have undergone or closely observed such events.

"Those in danger are those limited in skills, limited in scope and limited in their minds of what they can do," Baxter says.

Explore company needs

Baxter, hired initially for her expertise in interpersonal communications, had become the resident guru on personal computers, and she possessed well-developed training and writing skills.

Although she did not anticipate the takeover, Baxter kept her senses tuned to what was needed in the company. "Look at what people are reading in the elevators," she advises those who want to remain employed, noting that she had spotted a lot of people reading personal computer magazines at Clevepak.

She identified personal computer training as a void and began educating employees throughout the company about the machines' usefulness. "So when managers wrote up their personal goals, they wrote, 'to automate their departments, and I want Pat Baxter to help,' " she says.

Besides developing the diverse skills from which a newly formed company can draw, MIS professionals must also adapt to the new corporate culture.

Anyone who gripes about the new way of doing things or frequently reminisces about the good old days under the old management is not likely to be retained, says George DiNardo, executive vice-president of the Mellon Bank NA in Pittsburgh, which acquired the Gerard Bank of Philadelphia in 1983. In that takeover, there were no layoffs in the MIS operations.

But employees should not give up the old culture too quickly, because there are always things that can be learned from the past, DiNardo adds.

MIS professionals must also use interpersonal skills to adapt to the new company. "You have to use a whole new language with your new bosses," Baxter says.

There is a divergence of views about whether you should align yourself with your old-regime boss. One theory states that former MIS department managers, if they are strong allies, can promote your cause in the new company. But the opposite view can also be true — any alliances from the old company are poison.

"What is ordinarily the right thing to do is the exact wrong thing to do in a merger," says Susan Riskind, a San Francisco-based independent recruiter for the data processing industry.

In many instances, observers say, even flexibility, adaptability and outstanding skills will not save an employee. If one company acquires another for its product, technology or client list and decides that its own MIS operation is adequate, there may be nothing an employee of the acquired firm can do but start scanning the Help Wanted ads.

Baxter says that despite her

Pat Baxter

value to the company, she, too, eventually would have received a pink slip.

In many instances, who will stay and who will go is decided long before employees have a chance to make a case.

As Charles Varga, publisher of the Frenchtown, N.Y.-based "Cerberus Report," says, "Once the men in pin-striped suits start peering over the partitions, 10% to 40% of the jobs are already gone."

Among the many incentives for new management to make personnel decisions speedily are telescoping periods of poor morale, tax advantages, savings in compensation and holding onto the best talent before it is snapped up by another company.

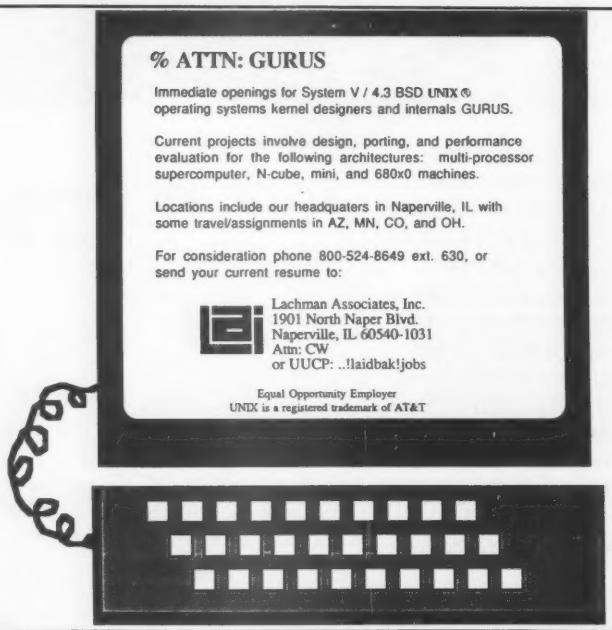
There are also two schools of thought about what a merger or acquisition does to career opportunities. According to Varga, such events are a disaster. There are simply more people competing for the same high-level posts.

James Kridel, executive vice-president at Glendale Federal Savings & Loan Association in Glendale, Calif., compares an acquisition with an adoption. He says that the employee of the acquired company is always at a disadvantage. "The adopted child is not blood," says Kridel, who, as a former executive vice-president of Crocker National Bank when it was acquired by Wells Fargo Bank NA, has been on both sides of the acquisition fence.

Regardless of the prevailing theories, a merger or acquisition could go either way for the employees involved.

"It depends on how good you are, your specialty and whether the company is in an expansionist mode," DiNardo says. If there are two MIS operations and the surviving company is seeking economies of scale, "then the opportunities are less, and you better be good."

Corman is a staff writer for *Banker & Tradesman.*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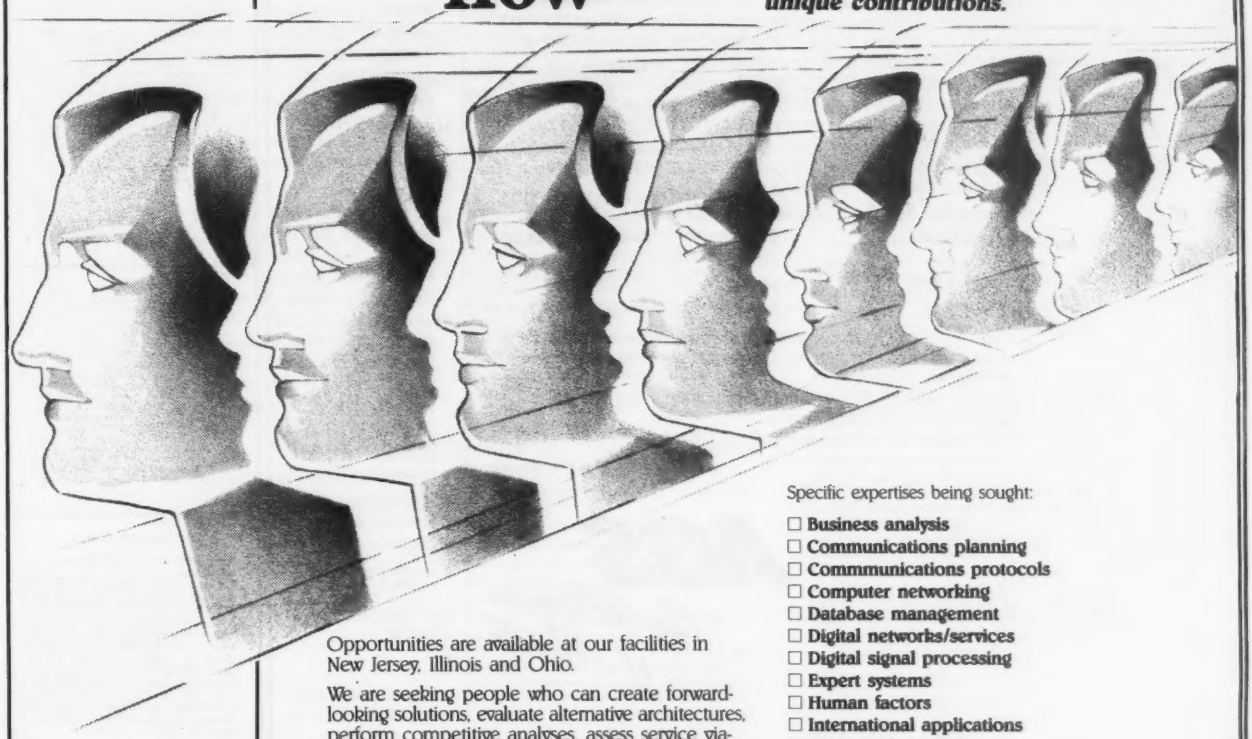

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40 hrs/wk, 9am-5pm; $28,000/yr. Job requires a M.S. Degree in Computer Science. Job also requires: 1) 2 grad courses in database; 2) 1 grad course in operating systems; and 3) 1 grad course in analysis-algorithm. Job duties: design and modify oncology system used for research of tumor development. Set up database system using INGRES DBMS under UNIX system V. Write programs for newly developed database system. Evaluate the complexity of the algorithm and the characteristics of the computer system to enhance the systems performance. Design a distributed database system for diagnosis protocol management for local area network. Qualified applicants should send resume and verification of reqs to: 7310 Woodward Ave, Room 415, Detroit, Michigan 48202. Ref # 24187. Employer paid ad.

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Requires BS degree with exp in IMS, DB/DC, TSO/ISPF and COBOL. Human resources or payroll/personnel exp a +.
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For more information contact the manager at:

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San Antonio, TX 78201
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Several North and South Carolina clients, primarily in the mfging industry, have multi positions available for PA's with solid RPGIII skills on Sys 38. Exp in design development, coding, listing and installations of both vendor and custom systems. Urgent needs!
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Please send your resume indicating desired position to: **Precision Visuals, Inc., Personnel Office, 6260 Lookout Road, Boulder, Colorado 80301.**

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West Virginia Network for Educational Telecomputing is a distributed computing network providing and facilitating instructional, research, and administrative computing for 16 state-supported institutions of higher education. WVNET has two full-time positions available immediately:

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Will establish and maintain productive relationships with current and potential users of WVNET resources; develop and administer a marketing plan which maximizes organizational revenue. Should possess a BS degree in C.S., Business, or related field. Three years work experience in a mainframe computer center setting; detailed knowledge of programming and systems analysis for both academic and administrative computer applications; understanding of trends within the computer industry; excellent communication and presentation skills; and basic knowledge of economic principles and accounting methods. Salary $28,440.

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Will coordinate organizational efforts in the areas of planning, including performance monitoring, capacity planning, strategic planning and capital upgrades; supervise small staff in support of these areas, provide technical support to the Assistant Director. Should possess a BS degree in C.S. or related field (Masters preferred). Four to five years work experience in performance analysis and tuning of large computer systems; knowledge of statistical methods and forecasting and excellent communication and presentation skills. Salary $34,824.

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Sterling Software, Answer Systems Division
100 So. Wacker Dr. Suite 1900
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BS in Electrical Engineering or Computer Science is required.

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BS in Computer Science or related field required. Responsible for the analysis, coordination, testing and implementation of computer systems in the field of finance, payroll, personnel and related systems.

5 yrs. experience in the following computer related fields: systems analysis and design; systems integration and quality assurance; automated test tools development; procedures development and documentation; user interface and training; CICS, ADABAS, TSO and COBOL.

Fluency in English & Arabic is mandatory.

We offer an excellent benefit package including medical, life, accidental death, disability and profit sharing plans. You will additionally receive 25 working days vacation, free furnished housing, annual return home travel, paid relocation expenses, plus eligibility for present Federal Income Tax exclusions.

Please send resume with present salary history, indicating position for which you are applying, to Personnel Dept. CW-5/4, SYSOREX INTERNATIONAL, INC., 10590 N. Tantau Ave., Cupertino, CA 95014. U.S. CITIZENSHIP REQUIRED. Principals only apply.

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The qualified applicant must have graduated from a college or university with a Bachelor's degree in computer science or a related field, plus five (5) years of experience in systems and programming development with at least three (3) of those years in systems software; or an equivalent combination of education and experience. The maximum starting salary of the position is $34,674.00 annually.

Vermillion is located near the Missouri River in extreme southeastern South Dakota, 60 miles south of Sioux Falls, South Dakota and 120 miles north of Omaha, Nebraska.

Application and/or resume must be postmarked on or before June 1, 1987. For more information call Jim Lydic at 605-677-5047 or send state application form or resume to: University of South Dakota, Personnel Officer, Slagle Hall 207, 414 E. Clark Street, Vermillion, SD 57069.

The South Dakota Board of Regents is an EOE/AA Employer and Educational System

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Senior Programmer Analyst/ Department Manager-
This position requires experience in C and COBOL programming, a thorough knowledge of UNIX and the ability to adapt network, system, and application software in a business environment. Since this person will also manage our programming staff, strong people skills are necessary.

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Applicants must show proven managerial leadership and be able to work well with top management. Minimum educational requirements: Bachelors Degree with Masters preferred. The salary range is $65K-$79K and is commensurate with experience. In addition, very good benefits are provided. Qualified individuals must respond by May 22nd, 1987. Please send resume with complete salary history in confidence to:

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January 13, 1986 — InformationWEEK

ISSUES & TRENDS

DEC Moves Into 'Main' Stream By Clustering VAX Power

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tion that Digital calls the VAXcluster. Digital has been making this argument repeatedly for the past year, each time raising its voice just a bit louder. Three of its top officers virtually shouted the proposition at the company's most recent system announcement, the unveiling of the "IS VAX 8650 on Dec 4. They "r their compute-

Well, yes and no. First the no. Digital doesn't expect companies with millions of their data-center dollars invested in IBM mainframes and software to junk their investment for the VAXcluster. "Anybody who tries to displace an entrenched vendor in a mainframe data-base situation—well, I can name them: GE, RC [illegible] Clorinox. You get th-

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  - government marketplace
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- Banking
- Finance
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- Manufacturing
- Education
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If interested please send your resume indicating location and position preference to Barbara Chaplick, Employment Consultant, Dept. 0504 7804, Digital Equipment Corporation, 5 Burlington Woods Drive, Burlington, MA 01803.

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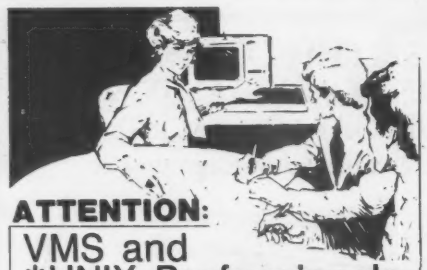

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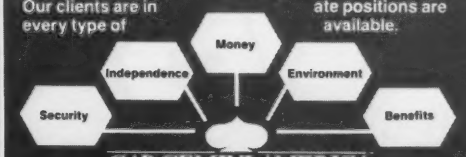

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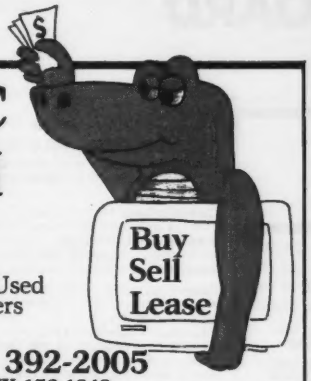

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DATE	TIME
May 8th, 1987	3 PM

FOR: Request for Information - Automated Revenue Vehicle Fleet Maintenance Information System.

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Vendors requiring any additional information should telephone Mr. Lackey at (207) 289-3531.

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NOTICE is hereby given that the Metropolitan Transportation Authority will receive proposals for the purchase by it of the following services indicated below. Proposals must supply with the Authority's Contract Documents. The Authority, at its option may enter into negotiations with proposers it selects as provided for in the Information for Proposers section of the Contract Documents. Copies of such Documents may be secured from W.B. Garrison, Director of Procurement Services, Metropolitan Transportation Authority, 347 Madison, New York, New York 10017.

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Computer industry rallies around bill to move data base oversight away from military. Page 10.

DEC jumps on the publishing bandwagon. Page 92.

Galaxy from Lotus picks up where Jazz limped off. Page 29.

A little-known company's DB2 dictionary is in use at a New York investment bank. Page 19.

Travelers Corp. MIS sails to Ireland for software development and maintenance. Page 57.

Microsoft promises 286-DOS tool kit within six months. Page 6.

BULLETIN: Datapoint Corp. Friday announced a 37% reduction in its U.S. work force, in addition to overseas cuts. Reporting a second-quarter loss of $65.8 million on revenue of $74.3 million, the firm said the severance of 786 employees, write-offs and reserves for products no longer deemed strategic will cost $56 million.

will be positioned ... IBM 9370 and DEC VAX 8300, according to Charles E. Exley Jr., chairman and president of NCR.

Like NCR's 9800 transaction processor, the Tower 32/800 system is based on multiple processors in a loosely coupled architecture.

Users can expand the system incrementally by adding plug-in processors to specifically handle application processing, file storage, terminals and printers, wide-area communications and local-area networks.

Under the modular architecture, segments of the Unix operating system are distributed to the specific processor responsible for that activity. This reduces system overhead on the applications processors and lowers system bus communications, NCR said.

The 32-bit system supports up to 64M bytes of main memory, 850M bytes of fixed-disk storage and 128 physical devices. In its largest configuration, the system offers a 14-fold performance increase over the entry-level Minitower, NCR said.

"At the same price point, the 32/800 delivers 1½ to two times the computing power of the 9370 — or conversely, the 9370 is 35% more expensive," noted

Continued on page 6

close to where the ... used. Once implemented, ... could better employ the processing power on personal computers and, in some cases, on minicomputers without becoming divorced from the central data processing function.

Some software vendors, such as Cullinet Software, Inc., Oracle Corp. and Relational Technology, Inc., say they believe distributed data bases will provide the bridge to link IBM mainframes to Digital Equipment

Network

Few doing Windows

User, developer apathy plagues year-old interface

BY PEGGY WATT
CW STAFF

Little more than a year after Microsoft Corp.'s release of its Windows interface, as many as four out of five copies are still stuck in the evaluation room or shelved until applications appear.

Users and developers are at a standoff. Users say they will not adopt Windows until they have applications; software vendors say they want proof of Windows' acceptance before they plunge into development.

In addition, some vendors claim a love-hate relationship with the Windows concept and its proponents. They complain about pressure from Microsoft to develop for its pet project or say that writing to Windows is too difficult to be done quickly.

Even those in the industry who say they like the idea of a universal graphical interface are not certain the winner is Windows.

The result is a lull in Windows activity. Infocorp, a market research firm in Cupertino, Calif., estimates 85,000 to 100,000 copies of Windows are actually in users' hands. That is only 20% of the 500,000 copies Microsoft claims to have shipped, including OEM-licensed copies and runtime versions bundled with Windows applications.

"It's a catch-22," says Tim Bajarin, president of market research firm Creative Strategies Research International in San Jose, Calif. "Developers, including Microsoft, have to get the applications out. But a lot of developers tabled it.

Continued on page 14

Mac ripens as business alternative

BY PEGGY WATT
CW STAFF

LOS ANGELES — With today's scheduled introduction of two open-architecture models of the Macintosh that also read Microsoft Corp. MS-DOS and Unix files, Apple Computer, Inc. said it intends to finally deliver the hardware that backs the company's pitch of the Macintosh system as a viable corporate alternative to the IBM Personal Computer.

In a show of support for Apple's new "open Mac" policy, a host of third-party developers this week also are scheduled to announce software that takes advantage of the systems' new color and capabilities and add-on boards that were previously not

Continued on page 94

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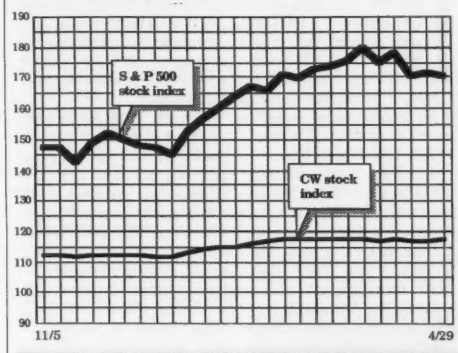

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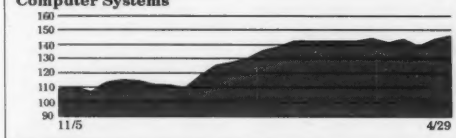

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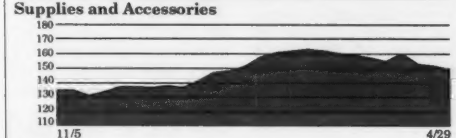
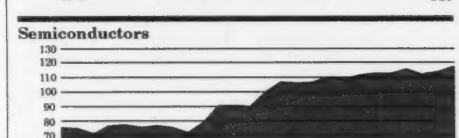
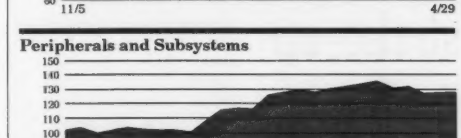


Software and DP Services

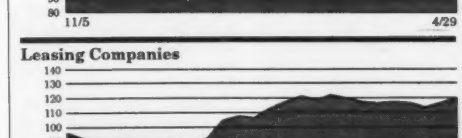
Semiconductors



Peripherals and Subsystems



Leasing Companies



CW CHART: SUSAN ALDAM

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 29, 1987

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH: N = NEW YORK; A = AMERICAN; P = PACIFIC; B = BOSTON; L = NATIONAL; M = MIDWEST; O = OVER-THE-COUNTER; S = SPLIT

Computer Systems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE APRIL 29 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	7	4	4.63	+0.0	+0.0
O	ALTOS COMPUTER SYS	19	10	12.13	-0.6	-4.9
A	AMDAHL CORP	41	15	40.13	+0.5	+1.3
O	APOLLO COMPUTER INC	23	9	20.75	+1.4	+7.1
O	APPLE COMPUTER INC	80	30	77.75	+3.5	+4.7
N	AT&T	28	22	24.50	+0.1	+0.5
O	C PT CORP	6	3	4.00	+0.0	+0.0
N	COMPAQ COMPUTER CORP	39	12	37.75	+6.3	+19.8
A	COMPUTER CONSOLES INC	12	7	10.38	+0.8	+7.8
O	CONCURRENT COMP CORP	19	11	15.25	+0.0	+0.0
N	CONTROL DATA CORP	34	20	33.88	+3.1	+10.2
O	CONVERGENT TECH	12	4	6.63	+0.1	+1.9
N	CRAY RESH INC	136	89	120.50	-11.5	-8.7
O	DAISY SYS CORP	14	8	8.88	-0.8	-7.8
N	DATA GEN CORP	42	25	31.13	+0.3	+0.8
N	DATAPOINT CORP	9	4	5.25	+0.3	+5.0
N	DIGITAL EQUIP CORP	173	81	171.00	+6.3	+3.8
N	FLOATING POINT SYS INC	45	11	12.50	+0.1	+1.0
O	GOULD INC	28	15	16.88	-0.3	-1.5
N	HARRIS CORP	41	27	39.00	-0.9	-2.2
N	HEWLETT PACKARD CO	63	36	56.75	+1.9	+3.4
N	HONEYWELL INC	84	58	80.13	+1.6	+2.1
N	IBM	160	116	158.63	+4.4	+2.8
O	IPL SYS INC	4	2	2.88	+0.0	+0.0
N	ITT CORP	66	44	56.13	-0.5	-0.9
N	M A COM INC	18	12	13.75	-0.5	-3.5
N	MATSUSHITA ELEC INDL LTD	136	77	113.00	+5.0	+4.6
O	MENTOR GRAPHICS CORP	33	11	32.25	+2.3	+7.5
N	NBI INC	14	8	11.13	+0.5	+4.7
N	NCR CORP	75	42	73.63	+2.3	+3.2
N	PRIME COMPUTER INC	29	16	27.88	+1.4	+5.2
O	STRATUS COMPUTER	38	18	37.25	+0.5	+1.4
O	SYMBOLICS INC	15	4	4.75	-0.3	-5.0
O	TANDEM COMPUTERS INC	75	28	73.75	+0.0	+0.0
N	TANDY CORP	56	31	44.38	-1.9	-4.1
N	TEXAS INSTRS INC	203	103	191.13	+0.6	+0.3
A	ULTIMATE CORP	35	13	21.75	+1.6	+8.1
N	UNISYS CORP	120	58	117.50	+1.0	+0.9
A	WANG LABS INC - B	19	11	17.63	+0.9	+5.2
A	WANG LABS INC - C	19	11	17.50	+0.1	+0.7
N	XEROX CORP	78	49	76.88	+0.3	+0.3

Supplies & Accessories

EXCH		52-WEEK RANGE (1)		PRICE CLOSE APRIL 29 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER BUSINESS PRODS	37	23	28.88	-0.6	-2.1
N	BARRY WRIGHT CORP	24	14	17.50	-0.9	-4.8
A	DUPLEX PRODS INC	23	18	19.50	+0.5	+2.6
N	ENNIS BUSINESS FORMS INC	23	14	20.38	+0.4	+1.9
N	3M CO	140	98	125.25	-1.1	-0.9
N	MOORE LTD	27	20	23.50	-1.3	-5.1
O	STANDARD REGISTER CO	53	32	46.00	-1.5	-3.2
N	WALLACE COMPUTER SVCS	50	37	44.75	-0.6	-1.4

Software & DP Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE APRIL 29 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	4.50	+0.0	+0.0
N	ADVANCED SYS INC	22	12	17.75	-1.4	-7.2
N	AGS COMPUTERS INC	41	17	40.50	+2.5	+6.6
O	AMERICAN MGMT SYS INC	36	13	34.75	-0.8	-2.1
O	AMERICAN SOFTWARE INC	22	7	16.75	-0.6	-3.6
N	ANACOMP INC	9	3	8.50	+0.6	+7.9
O	ANALYSTS INTL CORP	11	4	9.75	-0.5	-4.9
O	ASHTON TATE	30	10	22.88	-0.9	-3.7
O	ASK COMPUTER SYS INC	17	5	13.00	-1.4	-9.6
O	ASTRADYNE COMP IND	3	1	1.41	+0.1	+7.2
N	AUTOMATIC DATA PROC	51	29	46.00	-2.5	-5.2
O	BOOLE & BABBAGE INC	11	4	8.75	-0.5	-5.4
N	COMPUTER ASSOC INTL INC	48	20	45.25	+2.6	+6.2
O	COMPUTER HORIZONS CORP	15	10	13.25	+1.1	+9.3
O	COMPUTER NETWORK TECH	10	4	4.81	+0.0	+0.0
N	COMPUTER SCIENCES CORP	61	30	56.25	-1.5	-2.6
O	COMPUTER TASK GROUP INC	19	11	14.50	-2.0	-12.1
O	COMSHARE INC	18	11	16.00	-0.3	-1.5
N	CULLINET SOFTWARE INC	16	6	11.63	+0.1	+1.1
O	CYCARE SYS INC	17	7	8.13	-0.8	-8.5
O	DUQUESNE SYS INC	33	12	29.00	-2.5	-7.9
N	GENERAL ELEC CO	113	71	102.50	-1.4	-1.3
N	GENERAL MTRS CORP (CLASS E)	50	24	37.75	+0.8	+2.0
O	HOGAN SYS INC	17	9	16.00	-0.4	-2.3
O	INFORMATION SCIENCES INC	4	1	1.13	-0.1	-10.0
O	INFOTRON SYS CORP	17	7	9.00	+0.3	+2.9
O	KEANE INC	16	5	9.00	+0.3	+2.9
N	LOGICON INC	38	22	24.75	+0.1	+0.5
O	LOTUS DEV CORP	34	9	33.25	+7.3	+27.9
O	MANAGEMENT SCI AMER	21	12	13.13	-1.4	-9.5
O	MCI COMM CORP	11	5	6.00	-0.3	-4.0
O	MICRO SYS INC	18	10	15.00	-0.4	-2.4
O	MICRO PRO INTL CORP	6	2	5.38	+0.2	+3.6
N	MICROSOFT CORP	109	26	103.25	+4.8	+4.8
O	NATIONAL DATA CORP	27	16	19.50	-3.8	-16.1
O	ON LINE SOFTWARE INT	24	10	22.50	+0.0	+0.0
O	ORACLE SYS CORP	29	7	24.50	+0.0	+0.0
N	PANSOPHIC SYS INC	21	12	18.50	-0.8	-3.9
O	POLICY MGMT SYS CORP	30	15	24.50	-1.0	-3.9
N	PROGRAMMING & SYS INC	13	8	11.00	+0.5	+4.8
O	REYNOLDS & REYNOLDS CO	42	27	33.25	-0.3	-0.7
O	SCIENTIFIC COMPUTERS INC	8	4	7.63	-0.3	-3.2
O	SEI CORP	31	15	27.50	-0.8	-2.7
O	SHARED MED SYS CORP	53	29	30.75	-0.3	-0.8
O	SOFTWARE AG SYSTEMS INC	22	10	12.75	-0.3	-1.9
O	SOFTWARE PUBG CORP	16	5	14.63	-1.4	-8.6
A	STERLING SOFTWARE INC	21	10	10.25	-0.5	-4.7
N	SUNGUARD DATA SYSTEMS	20	10	17.50	+0.5	+2.9
N	UCCEL CORP	36	18	30.75	-0.3	-0.8
N	URS CORP	21	13	18.13	-0.8	-4.0
O	VM SOFTWARE INC	45	16	39.25	+2.8	+7.6

Semiconductors

EXCH		52-WEEK RANGE (1)		PRICE CLOSE APRIL 29 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	30	13	23.00	+2.4	+11.5
N	ANALOG DEVICES INC	25	14	21.00	+0.5	+2.4
O	ANALOGIC CORP	14	10	11.38	+0.1	+1.1
N	APPLIED MAGNETICS CORP	37	13	36.50	+3.0	+9.0
O	AVANTEK INC	23	14	14.25	-1.1	-7.3
O	HADCO CORP	7	3	5.50	+0.1	+2.3
O	INTEL CORP	48	16	46.50	+3.0	+6.9
O	MICRO MASK INC	7	2	5.75	0.1	-2.1
N	MOTOROLA INC	60	34	60.13	+1.3	+2.1
N	NATIONAL SEMICONDUCTOR	17	8	15.38	+0.1	+0.8
N	TERADYNE INC	29	16	26.25	+1.5	+6.1

Peripherals & Subsystems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE APRIL 29 1987	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	5	6.75	-0.6	-8.5
A	ANDERSON JACOBSON INC	4	1	2.00	-0.4	-15.8
O	AST RESH INC	23	11	18.13	+1.1	+6.6
O	AUTOTROL CORP	10	5	9.13	+0.9	+10.6
O	AVANT GARDE COMPUTING	7	3	3.75	-0.1	-3.2
O	BANCTEC INC	14	6	13.50	-0.5	-3.6
N	BOLT BERANEK & NEWMAN	60	37	44.50	3.0	-6.3
A	CETEC CORP	8	5	5.75	+0.4	+7.0
A	COGNITRONICS CORP	5	2	4.13	+0.9	+26.9
N	COMPUGRAPHIC CORP	24	16	21.25	+0.5	+2.4
N	COMPUTERVISION CORP	23	10	18.25	-0.8	-3.9
N	CONRAC CORP	30	12	27.38	-0.1	-0.5
A	DATAPRODUCTS CORP	18	11	12.00	-1.0	-7.7
A	DATARAM CORP	17	7	7.25	-0.4	-4.9
O	DATA SWITCH CORP	9	5	6.63	+0.0	+0.0
O	DATUM INC	7	4	5.25	-0.1	-2.3
N	DECISION INDS CORP	15	7	7.50	+0.1	+1.7
O	ENDATA INC	9	5	8.88	-0.1	-1.4
O	EMC CORP	34	11	26.25	+2.3	+9.4
O	EVANS & SUTHERLAND	40	20	34.25	+0.8	+2.2
N	FLOATING POINT SYS INC	45	11	12.50	+0.1	+1.0
O	GANDALF TECHNOLOGIES	11	5	9.38	-0.1	-1.3
N	GENERAL DATACOMM IND	15	8	11.75	+0.8	+6.8
O	ICOT CORP	13	5	6.00	+0.1	+2.1
O	INFORMATION INTL INC	18	13	14.75	-0.8	-4.8
O	INTERLEAF INC	19	8	18.50	+3.9	+26.5
O	MEGADATA CORP	7	2	5.13	+0.3	+5.1
A	MSI DATA CORP	17	10	14.31	-1.3	-8.4
N	NASHUA CORP	31	21	28.50	-0.4	-1.3
O	NETWORK SYS CORP	19	9	10.13	-3.8	-27.0
N	NORTH AMERN PHILIPS CORP	46	35	39.63	+0.4	+1.0
N	NORTHERN TELECOM LTD	46	27	40.50	-1.9	-4.4
O	NOVELL INC	26	9	22.75	+0.5	+2.2
N	PARADYNE CORP	11	4	5.50	-0.4	-6.4
A	PENRIL CORP	8	4	4.63	-0.6	-11.9
N	PLESSEY PLC	41	24	38.13	-0.3	-0.7
O	PRINTRONIX INC	14	10	11.50	+0.0	+0.0
N	QMS INC	18	11	14.25	+1.9	+15.2
O	RAMTEK CORP	7	4	4.50	-0.4	-7.7
N	RECOGNITION EQUIP INC	27	10	18.38	-1.4	-7.0
O	SCAN TRON CORP	19	11	11.50	-1.0	-8.0
N	SCIENTIFIC ATLANTA INC	18	9	15.88	-0.6	-3.8
O	SEAGATE TECHNOLOGY	42	10	34.38	-1.6	-4.5
N	STORAGE TECHNOLOGY	5	2	4.13	+0.3	+6.5
O	SUN MICROSYSTEM INC	36	11	35.50	+2.0	+6.0
A	T BAR INC	8	5	7.88	-0.1	-1.6
A	TAB PRODS CO	21	12	17.50	-0.6	-3.4
O	TANDON CORP	8	2	5.25	+0.0	+0.0
A	TEC INC	6	3	3.38	+0.1	+3.8
N	TEKTRONIX INC	43	27	33.88	+0.6	+1.9
O	TELEVIDEO SYS INC	4	2	3.00	+0.0	+0.0
N	TELEX CORP	102	52	80.50	+6.3	+8.4
N	TIMEPLEX INC	41	14	38.63	+2.5	+6.9
N	TITAN CORP	11	6	6.75	+0.0	+0.0
O	WYSE TECH	30	13	26.63	+0.9	+3.4

Leasing Companies

EXCH		52-WEEK RANGE (1)		PRICE CLOSE APRIL 29 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	32	15	31.00	+1.0	+3.3
O	CONTINENTAL INFO SYS	14	7	13.75	+1.8	+14.6
O	FINALCO GROUP INC	4	2	2.88	+0.0	+0.0
O	PHOENIX AMERN INC	8	3	6.00	+0.0	+0.0
O	SELECTERM INC	12	5	4.75	+0.0	+0.0
N	U.S. LEASING	52	38	49.25	-0.5	-1.0

Lotus steals show

But IBM, DEC, NCR also display strong performances

After weeks of watching rival Microsoft Corp. grab all the stock market headlines, Lotus Development Corp. chimed in with a banner week of its own. Boosted by its software deal with IBM and another strong market week, Lotus vaulted 8½ points in the first four trading days to 34½, a 33% gain.

From Monday to Thursday, IBM also jumped 8½ points, to 160⅛, approaching its 52-week high. But Digital Equipment Corp. kept its head above IBM, rising 9⅜ points to 171½. NCR Corp. rose 6¼ points to 74½. And Microsoft was no slouch, moving up 5 points to 104.

The chip industry's biggest merger of the year sent acquiree Monolithic Memories, Inc. up 3⅛ points to 17⅝ Thursday on very heavy over-the-counter volume of 3.9 million shares. Acquirer Advanced Micro Devices, Inc., however, fell ⅞ of a point to 22⅛.

Cullinet Software, Inc., with the news that Chairman John Cullinane will leave this fall, dropped ¾ of a point on Thursday to 10⅞. Sequent Computer Systems, Inc. was the over-the-counter market's third most active stock on its first day of public trading, closing unchanged at 18⅝.

CLINTON WILDER

Lotus

FROM PAGE 1

Standard Edition and will exploit the Presentation Manager, a graphics user interface based on Microsoft's Windows. Lotus said it will begin to release the data base products after OS/2 with the Presentation Manager ships in mid-1988.

In addition, Lotus announced two new versions of 1-2-3 for the PC; 1-2-3 Release 3 will run on current IBM PC-DOS- and Microsoft MS-DOS-based systems as well as under OS/2. The company will also release 1-2-3/G, a version designed specifically for OS/2 that exploits the Presentation Manager. Prices for all announced products were not disclosed.

In addition to marketing 1-2-3/M, the IBM agreement calls for the two firms to work together on developing and marketing a "series of Lotus and IBM products for use on both mainframe and personal computing systems." 1-2-3/M, which will be marketed exclusively by IBM, is the first product in the series.

Questions raised

A large part of the IBM agreement concerns data base technology and calls for the firms to "explore personal computing data base applications that are compatible with IBM's SQL," a Lotus statement said. This aspect, however, prompted more questions than it answered.

One uncertainty is the impact of Lotus/DBMS on IBM's own SQL-based data manager, which will be embedded in OS/2 Extended Edition, IBM's proprietary version of OS/2. On the surface, Lotus and IBM appear to be offering identical products — SQL-based relational DBMSs that work with OS/2.

While neither IBM nor Lotus formally commented on the differences between the products, some observers and a Lotus source said they believe Lotus may contribute to IBM's development of the Data Manager portion of OS/2 Extended Edition, which is believed to be in the early stages of development.

Lotus officials, however, denied that such a plan is in the works. "The possibility of those two things melding is nothing that Lotus has raised," a Lotus spokeswoman said. IBM also downplayed the agreement's impact on the Data Manager.

A Lotus source said the relationship with IBM is in its infancy and that details have not been set. The two firms are currently on entirely separate development paths, the source said. A stronger possibility is that IBM will position Lotus/DBMS as a separate product with close ties to the Data Manager, Lotus officials said. Parts of the Lotus DBMS will work with pieces of the IBM Data Manager, according to David Gilmour, general manager of the Advanced Products Division of Lotus's Software Products Group.

The data base engine that Lotus has licensed from Gupta Technologies is based on an IBM DB2-compatible version of SQLbase, has built-in LAN support and is designed for concurrent access to data. Lotus is developing its own front end to work with the data base engine that exploits the Presentation Manager. Lotus is also touting Lotus/DBMS as having transaction-processing capability. The Lotus front end, like Gupta's own, will shield the user from SQL syntax.

In fact, a key selling point of Lotus/DBMS is the use of 1-2-3 as a front end. According to Lotus Chairman Jim Manzi, users can query the data base from within a 1-2-3 work sheet cell. "Users can view and manipulate records using the familiar 1-2-3 and friendly spreadsheet interfaces as well as through forms and other means," Manzi said.

The goal of 1-2-3 Release 3, which will reportedly be available in early 1988, is to exploit two markets by having the same package work under OS/2 and the MS-DOS Release 3 family, Lotus's Gilmour said. When running under OS/2, Release 3 will take advantage of the Intel Corp. 80286 chip's protected mode, which provides up to 16M bytes of random-access memory. However, it will also run within the 640K-byte limit of MS-DOS.

Lotus 1-2-3 Release 3 is intended to provide multidimensional spreadsheets as well as layered and linked spreadsheets. It also reportedly will contain improved graphics, programmable data import capabilities and applications development facilities that go beyond 1-2-3's current macro language.

Lotus also unveiled its modular approach to software that runs under OS/2. With this approach, applications can run in the same memory space and, through a direct connection, can exchange "live data," Manzi said. "All major Lotus applications will participate," he added.

'Don't tread on me'

Lotus's announcements also send strong signals to its competitors that the firm intends to regain its position as the leader in microcomputer software revenue. The agreement with IBM puts Lotus on an even footing with Microsoft in terms of its relationship with the industry giant. IBM's endorsement of 1-2-3 for the mainframe may also impede Microsoft's attempt to sell its unannounced PC Excel integrated spreadsheet product into large corporations.

Meanwhile, Lotus/DBMS is aimed squarely at Ashton-Tate's Dbase III, currently the leading microcomputer data base package. Ashton-Tate, however, has announced its intention to develop a LAN version of Dbase III that implements SQL. Ashton-Tate recently acquired SQL technology and a development team from Wordtech Systems, Inc.

According to most industry observers, the data base market could fragment dramatically when OS/2 applications become available, which creates an opportunity for Lotus to succeed. Microsoft is also widely expected to enter the data base arena and has long had a DBMS product manager, even though it does not yet have its own DBMS.

Ashton-Tate's best card is its base of more than 1 million Dbase users along with a sophisticated developer following. "Lotus will have to sell it to Dbase users, and I bet it won't be Dbase compatible. Ashton-Tate is in no way threatened by other data bases, but it is by compatible data bases," said Adam Green, a data base consultant.

Debate over host 1-2-3

Interest in mainframe spreadsheet software was revived last week when Lotus Development Corp. announced 1-2-3/M, a mainframe version of its popular microcomputer spreadsheet that will be marketed exclusively by IBM.

Lotus's 1-2-3/M, which is set to be available early next year, will be a replica of 1-2-3 Release 3, a new version of 1-2-3 that has yet to ship. The product, which turns IBM 3270 terminals into 1-2-3 workstations, is aimed at corporations that want to consolidate spreadsheets and firms looking to increase spreadsheet use without incurring the cost of additional personal computers or often costly individual software packages.

Lotus's 1-2-3/M will run on the entire IBM 370 family, from the 9370 to the 3090, under either the VM or MVS environments.

Users interviewed last week were torn on the subject of mainframe spreadsheets, which had luster several years ago but have lost ground to increasingly powerful microcomputers and microcomputer software.

For some users, the sluggish response time of mainframes when used for interactive processing boosted the popularity of PC spreadsheets. Additionally, many departments are billed for the use of mainframes, which also helped fuel the trend toward off-loading spreadsheet work to PCs.

Access Technology, Inc., which sells a version of its 20/20 spreadsheet for IBM hosts running VM, understands the difficulty of selling spreadsheet software for an architecture with slow interactive response time. "The basic operating environment is more transactional than interactive. It is the largest contrast between a PC and other environments possible and is not a highly exciting environment for that type of software," said Jay Yesselman, 20/20 product manager for Access.

But for Fred M. Zickert, manager of personal computers for Eaton Corp., the prospect of 1-2-3 on an IBM host is exciting, particularly for spreadsheet consolidation. Eaton currently consolidates spreadsheets from all over the U.S. using a complex series of steps involving PCs and other systems. "Central consolidation is much simpler," Zickert said.

Zickert, however, worried about the downside to mainframe spreadsheets. "If users start working off the mainframe, we are going to have some disappointed people because of response time and cost. Every time you are on a mainframe, the meter is running," he said.

One mainframe spreadsheet fan is Michael Gross, controller for The Brodart Co., which uses 20/20 on an IBM host. "We have dial-up terminals into the mainframe, which allows everyone to use it. If [the spreadsheet] was on PCs, it wouldn't have as widespread use," Gross said. Response time for Brodart's some 20 users has not been a problem. "It doesn't appear to be slow at all. We are very happy with response time. Most PCs couldn't produce that kind of response time," Gross said. He added that Brodart's mainframe is not burdened by as many users and applications as are large corporations.

Lotus also said it is "investigating versions of 1-2-3 for other large systems environments." The firm has been working on a version for Digital Equipment Corp. VAX minicomputers, a highly placed Lotus source recently told *Computerworld*.

DOUGLAS BARNEY

AMD acquisition may foreshadow semi shake-up

BY JAMES A. MARTIN
CW STAFF

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) last week announced an agreement in principle to acquire Monolithic Memories, Inc. in an alliance some analysts said could provide a model for a further consolidation in the beleaguered U.S. semiconductor industry.

The agreement calls for all 21.8 million shares of outstanding Monolithic common stock to each be converted into 0.875 shares of AMD stock. The value of the transaction is estimated at $438 million. "This is the kind of thing we need to see and will see more of in the future," said Andrew Rappaport, president of The Technology Research Group, Inc. in Boston. He said the U.S. semiconductor industry could benefit from a period of consolidation as a result of competitive pressures from Japan.

"It's hard for a fragmented industry like this to make the kind of investments it needs to make and to take the strategic direction it needs," Rappaport added. In the short term, Monolithic will operate as a wholly owned subsidiary of AMD, but long-range plans call for complete integration. The combined companies will have about $1 billion in revenue, propelling AMD into the top 10 worldwide chip vendors and possibly into the No. 3 spot in the U.S. semiconductor industry behind Texas Instruments, Inc. and Motorola, Inc. Intel Corp. and National Semiconductor Corp. each recorded revenue of roughly $900 million from semiconductors in 1986, according to In-Stat, Inc., a Scottsdale, Ariz., research firm.

AMD and Monolithic should offer a good product fit, Rappaport said. Both product lines are primarily based on programmable-logic integrated-circuit technology for high-speed applications. They also have a consistent customer base, including designers of array and digital-signal processing systems. Although the two companies' strengths are compatible, so are their weaknesses, according to Stuart Johnson, a semiconductor analyst with Wertheim Schroder & Co. in New York.

However, he said the corporate cultural fit between the two companies is "as good as it could be, and the product fit is not bad."

Tandem to recast product line

Firm to add to high-end packaged systems, cut prices on mid-level CPUs

BY JEFFRY BEELER
CW STAFF

CUPERTINO, Calif. — In a wide-ranging shake-up of its product line, Tandem Computers, Inc. is expected today to broaden its selection of high-end packaged systems and reduce both the single-quantity and volume-discount prices for its intermediate-scale CPUs.

The company also is expected to enhance its communications capability with an additional front-end processor model and expand the I/O capability of its existing EXT computer family with an add-on cabinet that holds extra disk and tape modules.

To its VLX processor line, Tandem has added two entry-level packaged systems, one configured with two of the firm's existing VLXs and the other configured with three. Prices for the VLX 302 and VLX 303 start at $585,000 and $759,000, respectively.

High-end packages

At the opposite end of the same CPU series, the vendor has added four other system packages incorporating eight to 32 processors and ranging in price from roughly $2.1 million to almost $8.6 million.

Previously, the VLX line came with just one packaged system model containing four CPUs and starting at $1 million.

Availability of the eight- to 32-processor packages "will certainly increase the flexibility with which customers can upgrade their configurations" beyond four machines, according to Ray Wolfe, vice-president of business development at Litton Computer Systems, Inc. Wolfe, a VLX user, works for the Mountain View, Calif.-based firm that develops software for retrieving systems maintenance and reliability information.

At the high end of the VLX family, Tandem's aim in enlarging its packaged systems options is to highlight their price/performance edge over competing IBM models. For users, the system packages simplify the task of estimating how much hardware and money would be needed to achieve a given level of internal throughput, according to Terry Retford, Tandem's manager of processor and memory products.

Along with dropping the entry-level price point for its VLX packaged systems, Tandem will cut, by 15% to 25%, the price of two-, three- and four-processor TXP configurations.

Similar pricing changes will be announced for Tandem's EXT processor family, which can be upgraded to the TXP, Retford said. As a result of today's announcement, the firm has trimmed the single-quantity price of a basic EXT10 by 9%, to $74,900. The EXT10's larger sister system, the EXT25, has simultaneously had the price of its minimum-configuration unit lowered by 23%, to $250,000.

Tandem's price cuts also extend to EXT10 and EXT25 systems that are bought in bulk. In quantities of 25 to 39, for example, the cost of an EXT10 has dropped from $61,875 to $59,171.

The price reductions come hard on the heels of Tandem's introduction of two distributed processing systems costing less than $60,000 and strengthens suspicions that the EXT10 is nearing retirement, according to Bear Stearns & Co. analyst Jonathan Fram.

Mid-range additions

In other EXT-related developments, Tandem will offer users of the mid-range machines an optional add-on expansion cabinet that holds 16 I/O slots. The enclosure provides room for two cartridge tape drives, four 5¼-in. Winchester disk units, a streaming-tape system and a communications package that supports 144 asynchronous lines.

Starting immediately, Tandem also plans to ship an enhanced version of its Model 6100 communications subsystem. Unlike its predecessor, which requires special environmental controls, the 6100E can operate in an ordinary business office and can be installed up to 1,625 feet away from its host. With the original 6100, the limit was 200 feet, according to a Tandem source.

Prices for the enhanced subsystem start at $14,696.

Tandem VLX packaged systems

Specifications for minimum configurations

Model	Number of CPUs	Main Memory (Mbytes)	Disk Storage (Gbytes)	Speed* (transactions per second)	Price**
302	2	16	1.6	13	59,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
801	8	64	6	50	2.1M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
803	24	192	18	150	6.4M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* When used with Tandem's Nonstop SQL relational data base management system.
** Includes Tandem's Guardian operating system, Nonstop SQL and new 6100E communications subsystem.
CW CHART

DB2

FROM PAGE 1

Few DB2 users are likely to take advantage of the change immediately, because they have reserved its use to customer information or inventory type systems that can accommodate slower performance.

But the change is expected to allow IBM to run its own benchmarks to highlight improved transaction processing capabilities.

IBM has acknowledged its intent to capitalize on a new feature of its 3090 mainframe to increase buffer pool size. The feature, expanded storage, offers up to 1G byte of silicon memory specially reserved for paging by the MVS/XA operating system.

'Can speed performance'

Tapping expanded storage for buffer pooling could reduce the number of times the DB2 media manager was required to retrieve data from disk packs. "If you can reduce the amount of I/O going on, you can greatly speed up performance," Ashton noted.

In its January announcement of the 3090E, IBM said it would "make changes to DB2 to capitalize on both expanded storage and new increased central storage. For example, DB2 will remove the current restrictions regarding the size of DB2 buffer pools. . . . This function should be generally available second-quarter 1987."

Release 3 of DB2 is expected in late May or early June, industry sources said.

The announcement did not specify whether the change in DB2 would allow the system's buffer manager to access expanded storage directly, which would be the first time any application software was given access to the nonaddressable memory pool, or whether expanded storage would be used by DB2 via the operating system's buffer manager.

Many early users of DB2 restricted themselves to the 1M-byte default size of the buffer pool that is logged on DB2 tapes as they are shipped. The 1M-byte size is frequently used by data administrators as they become acquainted with the relational product.

IBM recommends a buffer pool of 5M to 6M bytes for production purposes, and many users are reluctant to exceed that limit. They want the buffer pool to be backed up by main CPU memory, not just virtual memory, and with other systems running on their CPU, users will be stingy in reserving large buffer pools, Ashton said.

> "IT [the larger DB2 buffer pool] is a fifth-order variable. It's not something that's going to yield an order-of-magnitude improvement."
>
> THOMAS H. SAWYER
> CODD & DATE CONSULTING GROUP

Although DB2 has a limit of 128M bytes per single buffer pool, Colin White, editor of "InfoDB," said he knew of no customers making use of buffer pools up to that limit. "InfoDB" is a San Jose, Calif.-based newsletter on DB2. Others questioned how important it would be to users for DB2 buffer pools to be able to use expanded storage.

"It's a fifth-order variable. It's not something that's going to yield an order-of-magnitude improvement," said Thomas H. Sawyer, a senior consultant with Codd & Date Consulting Group in San Jose, Calif.

Pool seen as boon

But one user said a large buffer pool would be a boon in using a major production system. Tom Nirmaier, vice-president of Chase Manhattan Bank in New York, supervises a DB2-based customer information system covering 1.3 million customers and 2 million accounts (see story page 23).

"Now that users are using the customer information system, they are asking for more and more and making heavier queries," he said. An ability to create a buffer pool of several hundred megabytes without tying up main CPU memory would allow him to load tables from the customer information system into the CPU, speeding response times, Nirmaier predicted.

"Very large buffer pools are going to help them. The bigger the pool, the more data you can get in there," White noted.

IBM ups support tool power

BY CHARLES BABCOCK
CW STAFF

RYE BROOK, N.Y. — Application System, IBM's decision support software tool, has been enhanced to function more completely with IBM's relational data base management system products, IBM spokesmen said last week.

Application System is what IBM terms a strategic product and provides standard decision support business tools, including multidimensional modeling and charting capabilities.

But the main enhancement to Application System Release 5 was the stronger capability of working with IBM's DB2, SQL/DS and Query Management Facility, the query and report writing component of IBM's relational DBMSs, according to Pamela A. Evans, an IBM spokeswoman with the Information Systems Group in Atlanta.

Release 5 uses the same terminology — tables, rows and columns — as SQL/DS and DB2, and tables from both DBMSs can be specified in the INCLUDE command. Major components, such as the Network tool set and Model tool set, can access and make use of data in the relational DBMS, IBM said.

The release will reportedly be available June 12 at prices that range from $29,400 to $117,600, depending on processor size. It runs under both the VM and MVS operating systems.

Activity identifiers — a frequently requested improvement — have been added to the Network set of tools in Application System. They may consist of up to 20 alphanumeric characters, Evans said.

Gantt charts are provided in Release 5 for displaying project details with high-resolution graphic displays. Logic diagrams have been extended to allow a project controller greater control over the positioning of boxes to be displayed, which is another Network tool.

The Model tool set includes the capability to construct models in 12 dimensions instead of three.

Extensions to the Model IMMEDIATE command enable a user to build on an existing model and to navigate around both the model and the results. In addition, built-in functions have been increased and include "Internal Rate of Return" for cash-flow analysis and "Double Declining Balance" for asset depreciation.

Upgrades pledged for Sperry CPUs

1100/90, V series upgrades show Unisys keeps faith, Blumenthal says

BY JEAN S. BOZMAN
CW STAFF

DETROIT — Unisys Corp.'s 1100/90 mainframe will be enhanced through a series of follow-on products by the end of the year, Chairman W. Michael Blumenthal said shortly before the company's annual meeting here last week.

There will also be a series of upgrades to the high-end 1100/90 running from the end of 1988 until some time in 1991, Blumenthal promised. The upgrades, he indicated, are expected to come even faster than they would have without the 1986 merger of Burroughs Corp. and Sperry Corp. "Sperry users are going to get follow-on systems even more quickly than they would have otherwise," he said.

Blumenthal said the forthcoming products are a sign of Unisys's commitment to its installed base of customers. "We will keep faith with our traditional customers by continuing to build upon the traditional mainframe products in which they have invested so heavily," he told the shareholders.

A second example of that commitment, Blumenthal said, is the planned addition of both high- and low-end models to the V series, which was part of the former Burroughs line.

But it is in the area of low-end products that Unisys intends to broaden its product line. The company plans to add several significant workstation, distributed network and departmental systems products in the next 12 months, Blumenthal said.

New series taking shape

Customers of the former Burroughs and Sperry lines can expect both mainframe architectures to be maintained for the near future. At the same time, however, a new series of interfaces between the two architectures is taking shape. An accelerated program of building interfaces between the systems has been put into place, he said. Among the links are Unix and new levels of connectivity written under Unisys's Linc and Mapper fourth-generation languages. "We are moving forward actively to create more links between the A series, the 1100 and the V series through Unix and to link with other systems through SNA," he said, referring to IBM's Systems Network Architecture. One example of the Unisys approach to connectivity between Burroughs and Sperry systems is the recent introduction of interfaces between the B 38 workstations and the former Sperry personal computers.

Unisys's Blumenthal

In the future, the first products of combined Sperry and Burroughs research will be introduced with the connectivity built in. "Over the next several years, the full fruits of our combined research efforts will become evident," Blumenthal said. "The Unix products will really be a result of the amalgam of the two companies," he added.

Unix products particularly will account for a sizable portion of Unisys's anticipated increase in market share, in part because Unisys now sells the broadest range of Unix capability on the market, he explained.

Blumenthal's address — the first since Sperry and Burroughs merged — focused on the company's direction. Services, such as data services, hardware maintenance and software support, should also be growth areas.

He predicted that Unisys will be able to expand its $9 billion business at a rate of 10% compounded annually.

Layoffs and terminations are not expected to exceed the 12,000 announced earlier this year. Right now, Unisys is generating $9 billion in annual revenue and has 90,000 employees in more than 100 countries worldwide, the company said.

And despite some difficult adjustments, the company intends to maintain dual headquarters in Detroit and at the former Sperry campus in Blue Bell, Pa. Top executives are keeping dual offices in both locations, Blumenthal said, while fewer than 200 staffers were forced to move either way. "We moved a relatively small number of people, which was more economical than moving everyone to one headquarters," he said.

"It's a bit awkward for some of us," Blumenthal said, adding that he was putting in 70-hour work weeks with much of that time spent traveling between the two headquarters. "But it seems to be working out."

No plans to retire

On a personal note, Blumenthal added that he was maintaining a residence in Ann Arbor, Mich., and is building another in Princeton, N.J. "That is a situation that I will continue to maintain as long as I remain with the company," Blumenthal said. He added that he intends to move to Princeton following his retirement but cautioned that, at 61, he is not ready to retire just yet.

In the meantime, he said, "I'm not a lame duck. I'm on the job full-time. But I'm old enough that I am beginning to think about retirement."

During the shareholders' meeting, it was announced that the Unisys board of directors had voted to propose a three-for-one stock split, an action that stockholders must approve. News of the action, along with an increased dividend, prodded Unisys stock up to more than $120 a share on Thursday.

INSIDE LINES

Thorny problems. Japanese Prime Minister Yasuhiro Nakasone, visiting Washington to defuse trade tensions at the same time the U.S. House of Representatives was approving legislation aimed at forcing Japan and others to reduce trade imbalances, described the recently imposed U.S. tariffs on Japanese products (including 16-bit micros) as "a thorn in our finger which should be removed as soon as possible." But the Reagan administration is not likely to lift the sanctions until early June. Reagan is caught between the need to show Congress that he is being tough on the Japanese and the need to stay friendly with Nakasone, who has political troubles at home.

Looked at by Lotus, they feel it. In announcing a first-quarter loss last week, Paperback Software acknowledged that Lotus's "look and feel" lawsuit in January cut into sales of Paperback's VP-Planner, the program that Lotus claims infringes on its copyright of 1-2-3. But Paperback said sales of the product "recovered somewhat" in February and March. Paperback lost $49,000 on revenue of $1 million; a year earlier, the firm earned $3,000 on sales of $650,000.

A multiple paradox. On May 18, Ansa Software will formally announce its local-area network version of Paradox, a microcomputer data base package. The firm may also unveil its plans for SQL, a source reports.

Bargain basement publishing. Ashton-Tate is expected to announce and ship its desktop publishing package early this summer, a source close to the firm reports. The package, which was bought from Skisoft a year ago, differs from most high-end desktop publishing packages that require large amounts of random-access memory, a hard disk drive and high-resolution graphics. The package works on 256K-byte machines with monochrome monitors.

Norris's Boswell. Joining Lee Iacocca, Akio Morita and An Wang on the corporate bookshelf next month will be the biography, *William C. Norris: Portrait of a Maverick*. As with the other recent books, however, readers should not expect an objective assessment of the controversial Control Data founder. The author is CDC Director and former management consultant James C. Worthy, who brings to the book "first-hand knowledge from his 20-year friendship with Norris."

April . . . no, May! That's the ticket. After making a lot of noise about its multitasking, Microsoft MS-DOS-compatible operating system for Intel 80386-based systems during the past eight months, The Software Link has missed its second ship date. A spokeswoman at the small, Atlanta-based firm explained that the company has not yet completed compatibility testing for some major business applications and RAM-resident software. "We don't want it to be premature, but it's not going to be on the vaporware list," she said. Introduced in September 1986 as an advanced replacement for MS-DOS, PC-MOS/386 was scheduled for shipping in February, then April. The target ship date is now early May.

Confidential advice. First it was H. Ross Perot allied with Steve Jobs. Then last week, PC's Limited, the Austin, Texas-based mail-order PC-clone outfit, elected none other than former National Security Agency head and deputy CIA director Adm. Bobby R. Inman to its board of directors. Perhaps Inman feels that PC's Limited founder Michael Dell's low-cost approach to the micro business represents a better boost to American competitiveness than the pooled research efforts of MCC, from which Inman resigned as chairman last year.

Open for a price. IBM has reportedly approached Compaq about licensing its Micro Channel architecture. Sources say the move is a message that IBM has patented the technology and will sue anyone who tries to copy it. IBM may be telling the market that the Micro Channel is an open architecture, but they are also making it clear they want people to pay for the right to use it. "When they [IBM] come to you with a license, you better get the message that you shouldn't clone it," one source says.

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